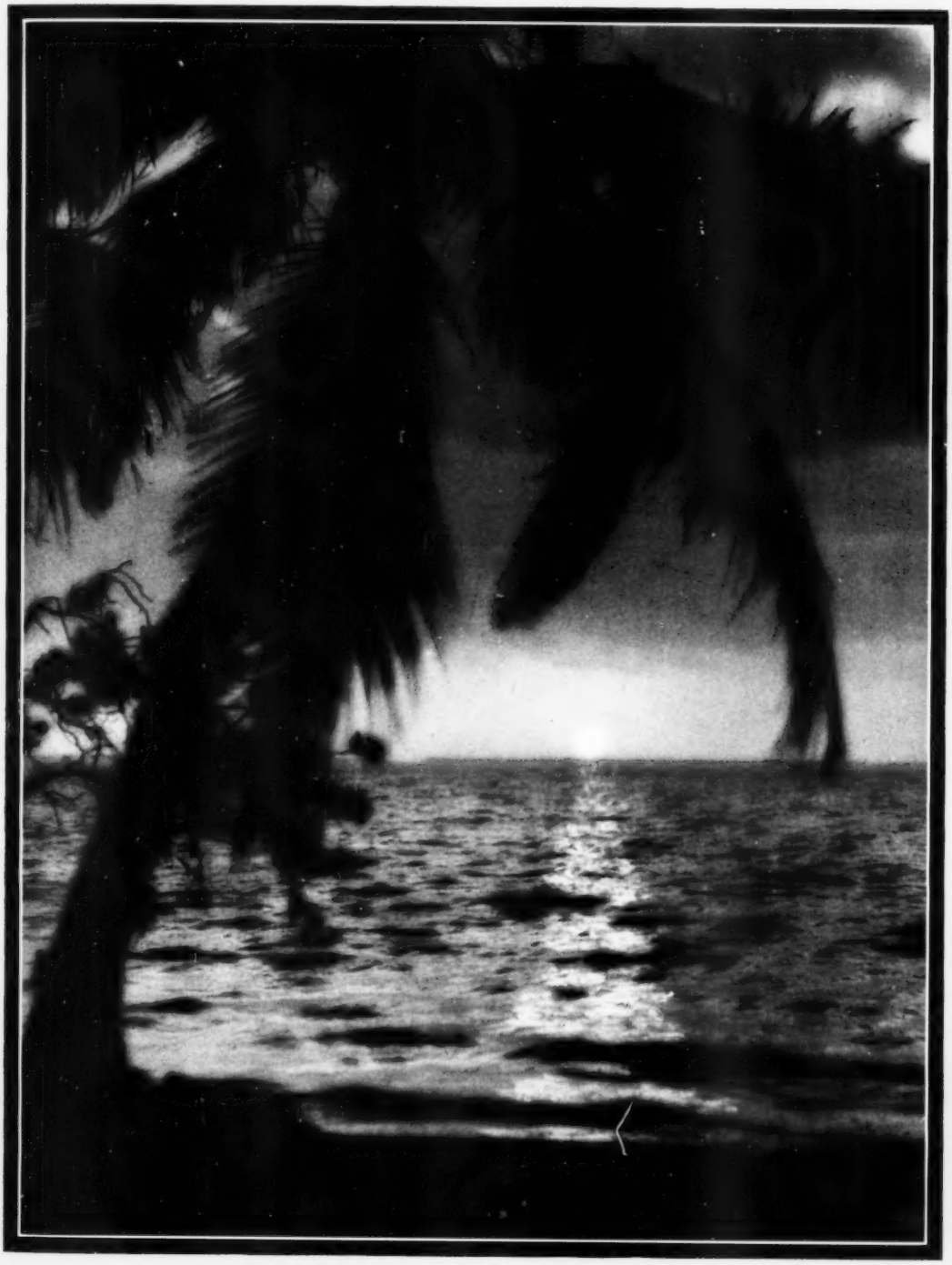
American FORESTS



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Courtesy The National Park Service

A Feature of Yosemite's Winter Landscape—Snow-Covered Oak Limbs Against a Deep Blue Sky.

AMERICAN FORESTS

OVID BUTLER, Editor

L. M. CROMELIN and ERLE KAUFFMAN, Assistant Editors

Vol. 42 **FEBRUARY, 1936** **No. 2**

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Photograph by ERNEST CRANDALL

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Please GIVE US A BREAK
LYNN BOGUE HUNT
By attending
THE NORTH AMERICAN WILD LIFE CONFERENCE
WASHINGTON, D.C. Feb. 3RD to 7TH 1936

THE CALL OF THE WILD

All America is called to unite in saving and restoring the birds and wild animals of North America through the Wildlife Conference called by President Roosevelt in the City of Washington, early in February. This meeting is epochal in that it is the first time in the history of the United States a President has called such a conference, and it promises to be the most important conservation event in 1936. See page 78.

AMERICAN FORESTS

Vol. 42 FEBRUARY, 1936 No. 2

THE WOODED EARTH

By JOHN T. AUTEN

SOIL to the average man is merely dirt — something which smudges his hands or "tracks" onto his wife's clean floor. If he gives the subject of soil any thought at all he considers it a necessary evil—a catalogued entity such as air, water, or, say, taxes. "Trees grow in soil," says he; "always have, always will. Farm land is plowed in the spring, cultivated in summer, and forgotten the remainder of the year."

The idea of raising soil from its lowly position and clothing its investigation with the dignity of a science is—"Well, why worry about it?"

Let me hasten, without being didactic, to lay down a working hypothesis as a major premise. The key to success in any program of forest restoration and continuous successful management depends on a detailed knowledge of forest soil.

Without at once defending this statement, it is necessary to become a little better acquainted with some of the essential characteristics of a forest soil. Soil scientists have adopted a very simple alphabet as a basis for describing forest soils. The alphabet is A-B-C. "A" is for aerated or upper zone; "B" is for bound or subsoil zone; and "C" is for country rock or mother soil zone. Forest soil, then, has three layers or horizons, one below the other like the layers of—well, perhaps one should not say cake. Percolating water from rainfall develops these layers in soil—the older the soil the more pronounced the demarcation.

If one were to set a large box full of coarsely crushed rock and fine soil, thoroughly stirred and homogenous, uncovered in an open field, the rainfall would gradually wash the fine soil downward through the crushed rock and concentrate it in a compact layer in the bottom of the box. If the box were tightly constructed, it might be possible that some water would always stand at a certain fluctuating level. In that case, the fine soil would be washed downward to the standing water level. The soil and rock mixture would then finally be separated into the three layers—A, B, and C.

The alphabet layers—A-B-C—of forest soil are shown in this profile, weathered from shale and sandstone. The "A" horizon is the layer of the upper soil, silty and loose. The layer consolidated by fine material washed in from above is the "B" horizon and "C," below is formed of the shale, or parent material.

The upper "A" horizon would be loose, coarse and porous, the middle or "B" horizon tighter because of the chinking in of the soil between the rocks, and the lower horizon unchanged in its relative amounts of soil and rock. This is precisely what occurs in soil growth. In the case of development of soil from bare rock, there is, of course, a gradual disintegration; then follows this segregating, stratifying process by percolating water. Soil is young, middle-aged, old, or mature, depending on the degree to which this segregating and stratifying process has proceeded. In a young soil such as a recent flood plain deposit, this segregation of soil particles is not developed to any great degree. A slice cut downward from surface to mother soil material does not show any great differentiation in degree of compactness between surface and subsoil. After several thousand years, if one could follow the development of the soil, he would find a tight layer beginning to form at some distance beneath the surface. After succeeding thousands

Roots help hold surface soil in place; but, remove the vegetation, and—

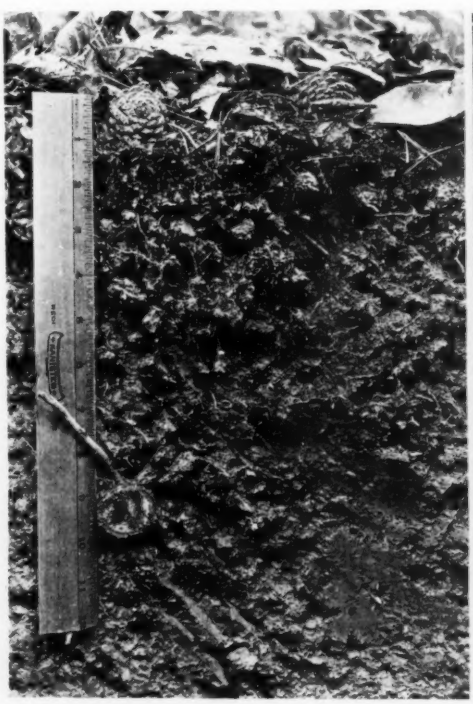
The inexorable forces of erosion, working slowly but surely, do the rest.

will crumble and slough down. You have done in miniature to the slice what cultivation of forest land has done to millions of acres in fields.

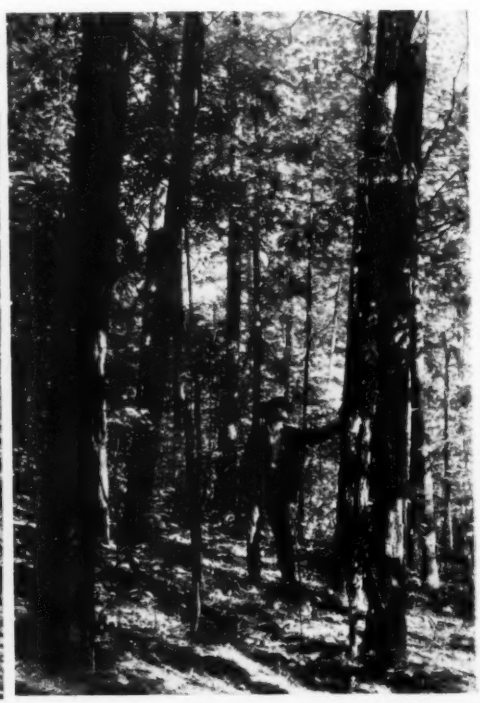
Examine the next lowest horizon. It will be more clay-like, for it contains most of the clay washed into it from the upper "A" horizon by rainfall. It has become consolidated; but even so, it will be divided by fine cracks into myriad small, irregular pieces like a mosaic. There will be tube-like cavities like a network of miniature t u n n e l s where roots have in past ages penetrated, developed, died, and decayed. Examine the lowest horizon and it will be homogenous in nature. There will be coarse and fine g r a i n s evenly distributed. The rainfall penetrating downward has not carried fine material as yet into it from above. It may be that the "C" horizon will be shale or bed rock which has not yet been weathered into soil. The A-B-C now lies before you—the "A" leached of its fine soil, the "B" more

of years, this tight horizon would have grown more dense. After fifty thousand years, more or less, he would find a subsoil horizon so tight and compact that it would almost prevent the downward flow of ground-water. The soil would have passed from youth to maturity.

Keep then in mind—all virgin forest soils of humid regions develop into a three-layered system like rugs laid one over the other. In your imagination, take a great knife — P a u l Bunyan style — and with it cut downward through the forest soil and remove a slice like a great piece of cake. Lay the slice flat before you and examine the successive layers from the surface horizon to the lowest horizon. The surface "A" horizon will be loose, porous, and interlaced with a mat of fine roots. The soil will be dark-colored downward for a distance of s e v e r a l inches. It is sponge-like and will absorb water about as fast as it can be poured into it. If it were not for the roots, t h i s surface horizon would at once be washed away. Remove the roots, stir the surface soil, and pour on water. The soil



A forest soil profile. The forest cultivates its own soil. There was no water shortage in the original forest, for there is no cover equal to forest cover for catching and holding rainfall.



This was an abandoned field eighty years ago. Reforestation can be done, but there is a narrow path to follow and only delving into nature's secrets will show the way.

dense by accumulation from above, and the "C" in a relatively unchanged condition. In this simple alphabetical arrangement lie the secrets of the loss of an empire by erosion. In the understanding and restoration of this A-B-C arrangement lie the hopes of reforestation and profitable continuous forestry operations.

This is the way of soil growth in the humid forest regions, but it is only half the story. The forest is a helpful partner. Soil in any forest region never develops bare and uncovered. If one could have followed the gradual disintegrating, soil-forming processes in the hills, he would have seen the slowly-growing mantle invaded by a continuously changing plant community. First appeared the lichens, then certain drought-resisting grasses and shrubs. The site was very dry at first because of the lack of a water-storing soil cover. As the soil mantle grew, the conifers entered the association. Their litter protected the growing soil from erosion and conserved the water supply. Finally, as the soil became deep enough and the water supply in it adequate, hardwoods appeared. The soil grew deeper, surface porosity increased, litter cover deepened, the forest air became more moist, and the extreme heat of summer moderated. Into the cool depths of the forest appeared the yellow poplar, the walnut, the white oaks, and beneath them gradually extended the moisture-requiring lesser vegetation. Under the forest stand was at length a soil reservoir adequate for water storage. Beneath the constantly decaying litter was an accumulation of organic matter and a readily available supply of plant food. The surface "A" horizon was loose, well aerated, and safe from the ravages of erosion. This was the virgin hardwood forest. As far as soil development is concerned, the picture is much the same in any type of forest. Change the names of species or stop at the pine stage of evolution and the picture fits the world over.

The farmer cropped the hills until the soil washed into the valleys, then he farmed the valleys.

Into this selected garden, into this handicraft of the centuries, onto this fertile soil like a thousand Nile Valleys together, came the feudal-crushed, debt-pinched, land hungry hordes from the older continents. Like a drought-starved, gaunt herd turned into a lush field of corn in July, they literally gorged their way across a continent. What they could not use, they wasted; they wallowed in it. They slashed and burned the woods; they plowed the soil of the hills until it washed down into the valleys; then they farmed the valleys and abandoned the hills to briers and brush.

What happened to the orderly arrangement of soil horizons carefully developed, loosened, rendered fertile, and preserved by the forests? The farmer wrecked the alphabet. Soil which never was agricultural soil in the beginning was cleared of its protective tree cover and planted to crops. Even with the handicap of hill land, had proper methods of cultivation and a proper rotation of crops been practiced, the productivity might have been preserved, but the farmer plowed up and down the hill. Furrows grew into gullies, and each gully reached out and scoured the cream of the soil off the surface. The fertile "A" horizon was soon gone, and then the "B", and in extreme cases all that remained was a hillside where here and there bare rock glared out.

Story of a crime without words. Shale lies near the surface—what chance agriculture?

Cultivated land today in the hill sections exhibits all stages of deterioration—partial removal of the "A"

(*Continuing on page* 94)

The Snowy Egret

MANGROVES AND MYSTERY

SUCH, IN SHORT, IS THE STORY OF THE PROPOSED EVERGLADES NATIONAL PARK

By W. ADRIAN WILLIAMSON

Photographs by Dr. Frank R. Oastler

CONGRESS was four years in passing a bill permitting a National Park to be established in the Everglades of Florida provided that the people of that State acquire the lands and present them to the nation. How many years will be required for the government to choose the lands and for the people of the State to purchase them, no one knows. From a similar congressional authorization, nearly ten years were required for the State of Virginia to acquire lands for the Shenandoah National Park, the deeds for which were presented to the nation on December 27, 1935.

But one thing is certain. If the land selections are confined to the primitive portions of the Everglades, America shall one day add a unique sub-tropical unit to its national gallery of scenic masterpieces.

For this area of 2,500 square miles is strikingly different in its flora and fauna, unduplicated in even the more torrid parts of North America. The reason for this has long been cloaked in mystery, but natural conditions existing today seem to offer the most plausible solution.

Two forces are driving constantly toward Florida—the trade winds and the waters of the Gulf Stream. The latter, pouring a hundred billion tons of water northward every hour, is probably the principal agency which has launched this invasion against our indigenous plants and animals. To the west and south of Cuba the purple waters of the Caribbean swirl around and get their start northward. The current sweeps the shores of Jamaica and the tropical islands that lie to the north, then starts a pilgrimage, as it were, of seeds and clinging animal life on driftwood and the crest of the Gulf Stream. After countless years, where the Stream passed close by Florida shores, a few seeds reached the mainland — as they are still doing today — and formed the incipient hammocks that time changed into impassable forests. Where the ground was favorable to hardwood trees, they flourished. Likewise, the mangroves sprang up along the shore and salt marsh lands. Beginning at Miami, the Florida Keys stretch in a graceful arc of sandy beaches, mangrove fringed shores and crystal lagoons for two hundred miles, finally terminating in the Dry Tortugas southwest of Key West. The Everglades National Park, it is hoped, will encompass a stretch of the most prolific and largest of these keys—Key Largo, the keys inside the main chain in Florida Bay, and a group of small islands in the south end of Biscayne Bay. These are composed of limestone, the only fossil coral reef in North America. The foliage is of dense growth as encountered in the rain forests of Jamaica and Central America. Feathery lysilomas, towering mastics, slick bark gumbo limbos, madeira mahogany—these and countless others have taken a stalwart stand upon the outlying keys.

And along the borders of this elevated reef grow the invincible mangroves, the builders and guardians of the land. This tree, which lives only in salt water, springs into being in the shallows and mud banks where the pen-like seed becomes lodged, sends forth innumerable stalks, each of which develops into a separate trunk, and forms a monster not at all tree-like in appearance. The branches and verdant foliage extend a hundred feet into the air, from which depend numerous air roots dangling about until they meet the mud and add another strengthening stay to the tree. As years pass the interlacing roots collect drifting material, and actually build the little mud flat above high water.

A beauty spot in the Everglades—a bit of water reflecting cabbage palms.

Some of these keys have been separated from one another for such a long span of years that the formerly similar species of plants and animals have varied from others in isolated localities. So, on one key is found a rare rat snake, a towering tree cactus, several species of gaudily colored tree snails—the only area in the world where these species are found. On all these keys there is some such peculiarity, some attraction that beckons the nature lover and the scientist; always a

In the cool depths of the cypress swamp. From Miami the Florida Keys stretch in a graceful arc for two hundred miles, and the proposed Park will include the most prolific and largest of the Keys, with their luxuriant tropical growth.

A young Snake-bird vehemently protests against intrusion.

But a young Brown Pelican looks gravely on.

Cocoanut Palms

Along the borders grow the invincible mangroves—builders and guardians of the land. This tree lives only in salt water, growing in the mud banks where the pen-like seeds lodge—reaching eventually the wierd and mysterious, untreelike growth of the mangrove.

Royal Palms

new and fascinating bit of scenery at every turn of the road.

The pirates of the Spanish Main occasionally landed on the keys and mainland, and in some instances actually used Florida as a base. Nearly every island has a pirate tale connected with it, or more substantial evidence in the form of rock carvings, remains of galleons, and sometimes a doubloon or piece of jewelry. The most colorful tale told of the early buccaneers is one of Black Caesar, a negro corsair, who had his headquarters on a small island eight miles north of Key Largo. From his lookout between the keys he would swoop down upon unwary merchantmen and sink them unmercifully in Hawk Channel. Cannon and anchors have been brought up from the submerged hulls, but most of the searches for treasure are in vain.

The general aspect of the land immediately to the west of Key Largo is more in keeping with the usual conception of the Everglades. Low, sawgrass-covered prairies scattered with hammocks, where occur an intermingling of the temperate zone and the tropical vegetation, extend to within twenty miles of Cape Sable. Waterways wind about toward the Florida Bay; alligators frequent the pools, and can be seen sunning themselves on the banks. Graceful swallow-tail kites, returned from their winter in Brazil, hover over the hammocks; white ibis wheel sharply over clumps of palms and stand out in bold relief against the turquoise sky and the crimson glow of the lowering sun. It is truly a bird's paradise.

On the northern confines of this area lies Paradise Key, not a key at all, but an elevated section standing above the damp muck lands. For years this reserve has been maintained by the Florida Federation of Women's Clubs as the Royal Palm State Park, the prominent feature being a large group of native royal palms. The vegetation is wholly tropical. Hardwood trees strive to reach the heights of the stately royal, but fall short hopelessly in a riot of leaves and flowering lianas. An exceedingly large variety of ferns, some with fronds attaining a length of forty feet, are festooned around the pot holes and dank recesses. Deer browse amid this splendor, munching the tender grasses that flourish beside the pools. Here, also, grows the delicate spider lily, forming a splendid setting for the immobile white egret once fondly coveted by plume hunters.

Cape Sable made its debut into the annals of history in 1514, when Ponce de Leon first set foot upon its shores. The scene has probably changed little since then. A fringe of coconuts has grown up; the jungle is a little thicker; the wall of towering mangroves on the west has built a considerable amount of land, extending Florida ever southward. Aside from that the same jungle skirts the twin arcs of white sand, the same tide rushes across Florida Bay and a few hours later plies as steadily and inevitably backward. The scene is beautiful, permanent, yet ever-changing in its simplicity.

The Cape is an admirable location for the headquarters of fishing parties. The readily accessible Gulf and Florida Bay afford wonderful opportunities for fishing. In fact, Gifford Pinchot said of it: "There are more fish around Cape Sable than I ever saw anywhere else in a lifetime of fishing." Tarpon can be seen flashing in the current near shore, and in the lagoons swims a colorful array of bottom fish. Huge sea turtles lay their eggs in the warm sand during the early summer.

The Shark River and Ten Thousand Island regions, which lie on the Gulf Coast, will be visited most advantageously by water. There land and water vie with one another for supremacy; the mangroves predominate, forming a labyrinth of green-arched waterways that wind aimlessly around in deep channels. Some of these lanes lead to extensive rookeries toward which myriads of ibis and herons can be seen flying at nightfall. Occasionally the rare roseate spoonbill flaps overhead, flashing its brilliant crimson plumage. Crocodiles inhabit the swamps, feeding upon marsh rabbits and unwary fowls. Back in the Bay sea cows or manatees—a vanishing mammal—move their bulks to wherever succulent grasses grow thickest. Spotted rays, a large pancake fish with a long tapering tail, flap across the shallows cracking the hard-shelled conchs for food. Perhaps a monster saw fish will rush past, cleaving the water with his formidable nose—a wicked weapon of cartilage armed with heavy, vicious teeth.

Last spring I was cruising along the coast twenty miles north of the Cape. I moored my boat in the shade of the mangroves, and followed up a winding slough on foot. The ground became higher as I progressed inland, and the mangroves gave place to hardwood trees. I left the slough behind and struggled painfully through a maze of undergrowth. I began to bear around to the north, and to pass through a jungle of large hardwood trees, tree cactus, and grotesque orchids. As I walked eastward again the jungle thinned out, and clumps of dog-ear cactus, ten feet high, became prominent. Cotton trees, six inches in diameter, were plentiful. Black mangroves, surrounded by thorns and vines, grew in the low spots. Then suddenly I encountered another type of vegetation. Stunted trees without a vestige of foliage presented a most sinister spectacle. Dismal gray moss, greenish lichens clothed the trees in a spectre-like garb; bright orange moss on the limbs, drooping like Neptune's locks, supplied startling patches of color. A hushed silence hung over the scene and added to the oppressive gloom. It was like a forest of another world, so unreal the landscape seemed.

Before the Seminoles, who migrated to Florida because of increasing population pressures in their hunting grounds, Indians from the West Indies, the Calusas, dominated the tip of the peninsula. They were a stalwart race, and a scourge to adventurers and homesteaders who settled in isolated regions. Chakika, the leader, has his rendezvous among a group of "islands" near the deserted town of Pinecrest, forty miles west of Miami. These hammocks stand on limestone pedestals above a sea of sawgrass, some a good many acres in extent, supporting tropical vegetation and animal life. Evidence still exists in the form of kitchen middens and scattered orange trees that they were inhabited in pre-Seminole times.

To the north of the Pinecrest area lies an expanse of cypress, bordered by miles of sawgrass. To the west and south is the town of Everglades, mangrove islands and estuaries—panoramas of lagoon and glade, forest and swamp. But Chakikas Islands are distinct from all this; they form a sort of melting pot for the shrubs of the temperate zone and those of the tropical—hammocks where the species of both areas mingle. Willows, a strand of cypress growing in a slough, and a tangle of vines usually surround the hammock. On higher ground a copse of maples survives the smothering tropical verdure, and live oaks withstand for awhile the crushing strangling figs. The hammock opens up perceptibly where the foliage of the large trees shuts out the light and stifles the shrubs and young plants.

But the Seminoles burn off the vegetation, erect palmetto thatched huts, plant a clump of bananas, sugar cane, and a few vegetables to fill the needs of their simple lives.

There are approximately four hundred Indians in South Florida. The Everglades National Park will be a boon to their existence, may delay indefinitely their extinction. During the Seminole War they cost the United States $40,000,000 and the lives of several thousand soldiers who were sent to quell the uprisings and subjugate them to the customs of the white man. Yet this was never accomplished, and the Seminoles remain today as reluctant to be Americanized as in the 1840's. They are an (*Continuing on page* 93)

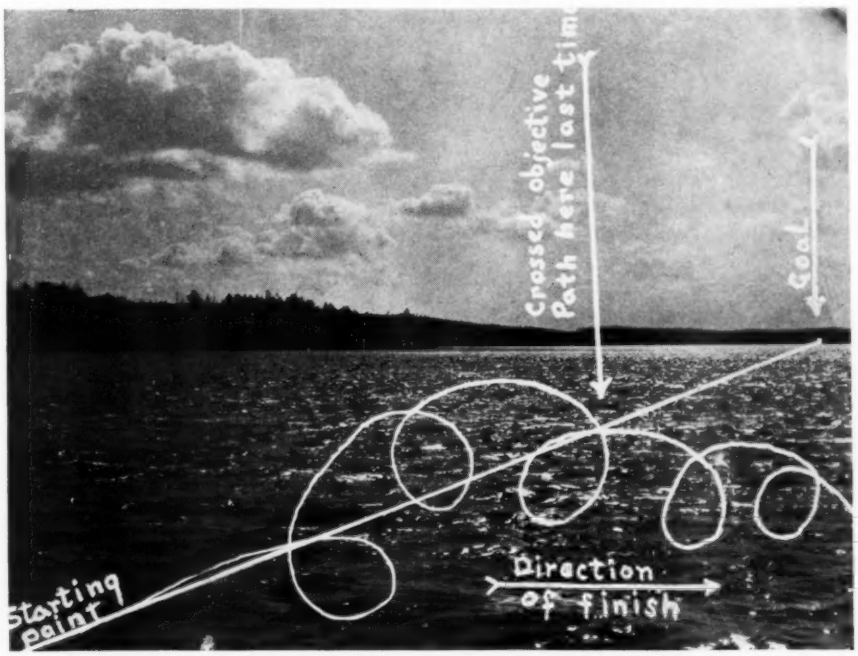
HAS MAN A SENSE OF DIRECTION?

By

CALVIN RUTSTRUM

MEN of the open for generations have vied with each other on that eternal subject, their sense of direction. A myriad tales have been told of the adventurous and uncanny feats attributed to this purported faculty. As far back as the fables of Egypt, these tales dot the perspective of literature; and no less do they adorn the present-day narrative. Yet, always with the fundamental idea that only a chosen few have been gifted with that conative impulse which holds them unwavering to the straight and ever-orientated course.

Now, whatever our conclusions may be on this point, it would be unwise to question the veracity of these story tellers insofar as the physical aspects of these feats are concerned; for they could, no doubt, have been accomplished either by minds attuned to keen observation, or by accidental circumstance. As to their performance through an instinctive sense of direction, we are immediately confronted with an insurmountable barrier of authoritative opposition.



The graph of the first direction test looked something like a coiled spring that had been bent out of shape!

Psychologists and physiologists unarbitrarily agree that man has no sense of direction. To the man of the forest, this may not be a very romantic bit of news coming from the professorial circle; but if true, it is nevertheless edifying. After a hard day in the woods, it might be well when returning to camp to know how much to depend on instinct, and how much to depend on sensible observation and the compass. There is a certain pleasure in living under illusions, but they are not at all conducive to our welfare when they affect our security, or apply to the extremely practical side of our lives. To confess—I have always been reluctant to acknowledge that secret consciousness of not possessing a sense of direction; meanwhile living with a certain envy of others who claimed to be so endowed. Therefore, the eminents whose task it is to explore our minds have given me no little measure of encouragement by the result of their findings in this interesting field of research.

It is interesting to note how these men of science, in refutation, have arrived at their conclusions. Not long ago several psychologists conducted a very interesting experiment on a perfectly level stretch of prairie ground. A great number of persons took part—old patriarchs of the early West, young cowpunchers, business men, sportsmen, university students, and others — many who alleged to possess a sense of direction.

A day was selected when no wind was blowing and the sky was overcast, so that the subjects should not be guided by the direction of the wind nor the warmth of the sun on one part of the body or another. They were shown an object on the horizon, and while facing it were blindfolded, then asked to proceed toward it. Some walked, some ran, others drove cars; all veered in a circle, and in their travels described something which looked like a spiral or a coil spring. As they proceeded, all were asked from time to time about their general direction and all were equally certain that they were continuing in a straight line. Later, when the experiment was transferred to the water — tests being made by swimming, canoeing, and rowing—the same results obtained. Without an exception they took to describing marine curves instead of straight lines.

There were some interesting disclosures. Even though all traveled in a circle, with now and then a short straight spurt, the spirals varied from twenty feet to four hundred yards. In an attempt to account for this peculiarity in man's nature, it was proffered that the difference in length of one leg over the other and their variations in strength caused this veering. Leg measurements and tests were made to determine these differences and compared with the veering registered on the charts of the subjects. The result of this observation ran the leg theory into the ground, and it was finally concluded that it was not, as had been supposed, a matter of relative leg-strength or leg-length at all.

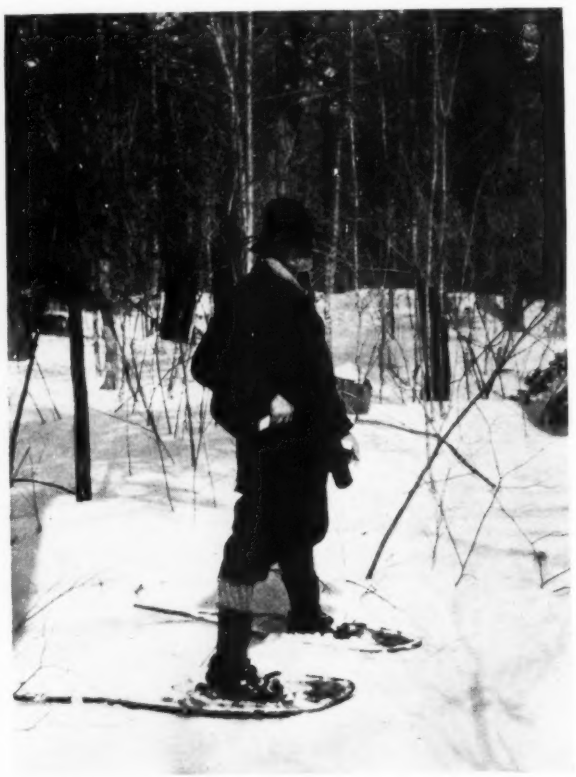
Moreover, it was not the result of being left-handed or right-handed. Tests exploded this tendered notion as well. Left-handed persons veered to both right and left, and likewise with right-handed persons. Many further presumed that it was a matter of muscles. This theory was quickly dissipated when a person was placed blindfolded beside a driver and asked to instruct the driver to turn either to the right or to the left, whenever it was felt that the car was not being held in a straight line of travel. Likewise in this case, curves and spirals were invariably the result.

The muscular theory and other physical attributions continued to lose value as further experiments were made. This was true when reversals and alternate action took place. Where the parties first walked forward for a while and then backward, the same peculiar cricles and spirals were followed out; sometimes to the right and other times to the left with no apparent modification through any attributed muscular weakness. In the case of swimming where the subject first proceeded forward in the normal fashion, then on his back, or with the side stroke, the circles continued. Whether in driving, walking, rowing, or swimming, the arcs in the charts of progress remained very much the same in size, except that the steady plodders described a slightly larger circle on the average than did those who were more impulsive in nature.

As manifested in other conditions of this kind, the explanation is not an easy one. Certain eminent physiologists believe that our tendency to describe a spiral when blindfolded is due to the nature of our nervous system. It may still remain a task for them to determine the real cause of this tendency toward the spiral; but for all practical purposes it has been quite well established that somewhere in the nerve system there is a spiralling mechanism. From observations made, it is not a matter of intelligence; and it would, therefore, be unwise to regard with disdain a guide who could not hold to the true course without the aid of his eyesight and the other senses. The interesting point here is that the imbecile and the intelligent man have shown in tests to describe the same spirals, when deprived of the use of their sight. An imbecile was taken from an asylum and blindfolded in the same manner as other subjects, with the resulting circumstance that the spirals were no less uniform than those described by sane individuals of high intelligence.

As an adjunct to the point in question, I might explain that the single-celled amoeba in its apparent groping, swims in this same circling style; a point which would probably have been of much interest to Darwin, in showing a connection between the first form of life and man. This circling is also true of animal life in general when it is frightened and is running from an enemy. The sense of direction of the lower animals, however, will be treated in a later article.

Veterans of the wilderness who have read to this point will probably suspect pedantry in the foregoing allegations of the professors. This skepticism, if it exists, is not in a way irrational. My experience in the wilderness had thrown me with men for whom I had the greatest respect concerning their "sense of direction," and it was not an easy matter for me to amalgamate the reasoning and research of the professors with the faculties I had attributed to these men of the out-of-doors. Hovering between a half believed revelation in the instinctive character of man and an almost traditional respect for the ability of certain woodsmen, I decided to make concluding experiments which would decide the question one way or the other as far as I personally was concerned.



A veteran of the wilderness, whose knowledge of the woods was the envy of most men he came to know. But even he failed to meet the test!

I had in mind, as one of the deciding factors, a friend whose travels from Ontario to Quebec have remained with me a symbol of fine woodsmanship. We regarded him as unexcelled in two things: he could make the finest bannock of any man in Canada and, when traveling, could find the shortest route between two points. Unfortunately, he had never obtained an academic education, but his knowledge of the woods was the envy of most men he came to know. Whatever my views are at this time concerning instinctive qualities, there is no question but that I believed my friend possessed a sense of direction. I had followed him through bog and timber when I was certain that he was as erratic as a chip in a maelstrom, only to find that we would suddenly come to our destination in a minimized length of time.

He was not a little offended when, one evening before a camp fire, I asked him if he had a sense of direction. This question had been prefaced with another, asking him how he got about the country so well. He balanced a small hot coal from the fire on a chip to light his pipe, and when it began to draw well, he said: "Well, b'y, it's sumthin' yu can't learn. If yu hain't got it yu hain't got it."

With as much diplomacy as I could conjure, I coaxed him into a test two days later when the lake was calm and the sky overcast. I pointed out a rocky abutment across the lake and asked him if he could paddle the canoe while blindfolded, and come within a reasonable distance of this abutment. I sat in the front seat and observed the result. Somehow I had a strong desire that he should win. The very traditions that had been handed down from father to son seemed involved in the success of his venture. The canoe was pointed straight as an arrow at the rocky abutment; and with a folded bandanna tied over his eyes and

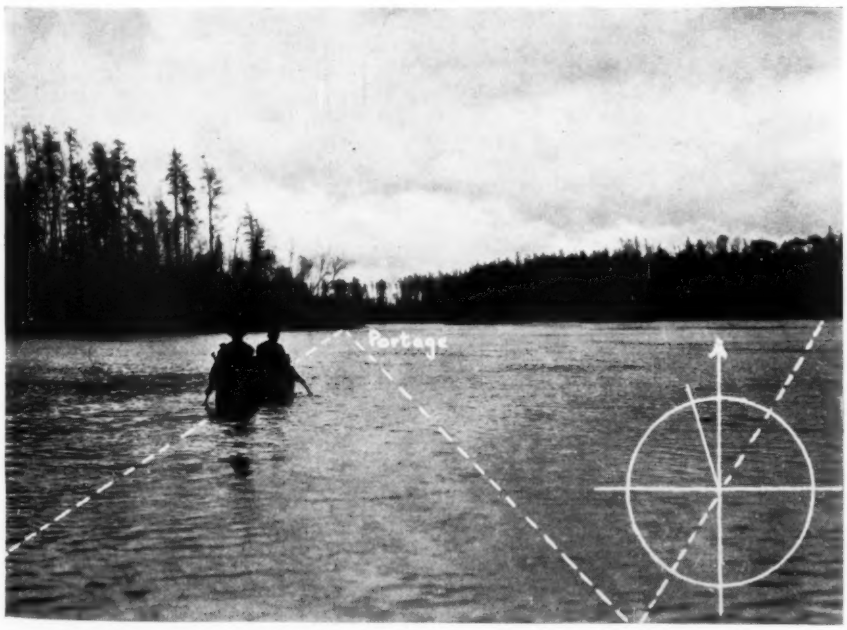
around his head, my friend began to paddle.

I could see grim determination in the set of his mouth, as though an inner sense were adjusted to a straight course and should not for a moment be relaxed. Within two hundred feet from the start, the canoe began to veer to the left, then held a moderately straight course for fifty feet, after which it began to veer again to the left. By now, the rocky abutment was several points off the bow and I had a fear that the professors were right. It was not long before we were moving almost directly away from the general direction of the abutment. Meanwhile, I was attempting to draw the course on a sheet of paper, alternately scattering pieces of birchbark on the placid surface of the lake to mark the course. The graph looked something like a coiled spring that had been bent out of shape. Bill finally ran ashore about a half mile from the starting point—almost opposite from the direction of the abutment—and there pulled the handkerchief from his eyes. He looked a bit bewildered, then asked to see the chart of his travels. We gained a high rocky point where patches of birchbark could also be seen strewn about the lake. He sat down on a rock and laughed heartily for several minutes, even though he must have sensed a sharp disappointment. His rational resignation to fact when it was apparent is probably the fundamental reason for his superior ability as a woodsman.

Subsequent tests brought out interesting manifestations of instinct in direction, but all seemed to establish that there is somewhere well established in the nerve system a spiralling mechanism.

It is needless to show the subsequent tests which were carried out from time to time in my own personal endeavor to get at the truth of this peculiar phenomenon; but I might give the conclusion ultimately drawn. It is my opinion that man has no sense of direction in that he possesses a biological compass which holds him to a straight course. I must agree with the professors that something akin to a spiralling mechanism controls the individual in his travels. Unless he can use one or more of the senses as a relative guiding factor to something in his environment alien to himself, he is unable to hold to the straight line or move from one point to the other consistently.

Ability to travel a straight course, as claimed by many guides, is plainly the result of their observation. At the end of the day, they may not be able to recall a single guiding unit; but, in their travels, they are, nevertheless, unconsciously projecting something ahead of them or moving in relation to some extraneous element in the landscape.



The man of the city with no wilderness training is soon lost in the forest, and a compass route is the most dependable.

(What about animals? Have they a sense of direction? Whatever your experience with them, whatever your belief, you will be intensely interested in what Mr. Rutstrum has to say in his second article, "Have Animals a Sense of Direction?" which will appear in the April issue of AMERICAN FORESTS.)

A MONARCH DIES

By PRESTON KING SHELDON

NO CASUALTY among the nation's trees has caused keener regret than the recent death of the famous Cedar of Lebanon at Flushing, Long Island. For more than 150 years it had battled against the elements—low temperatures and ice, storms and lightning, and human carelessness.

Its waning strength was suspected as early as 1930, but it was not until an electric storm in 1934 opened a fissure in its spire and trunk that its true condition was discovered. The old tree had lived its span. Shortly afterwards a slight paling of the foliage was noticed; then examination revealed a dried cambium layer at its base. It was the end. The great tree was no more.

The Flushing tree did not surpass in size some of its family growing on estates in England and France, or some of those sighted in the grove on Mt. Lebanon as late as 1906. But, with its flat, table-like branches spread against the sky, it rivalled them. It rose above crowded roofs of red and green tile and swarthy shingles, protected by a deed to the property where it was planted, which bound successive owners to do all in their power to prolong its life.

The terms of sale provided for passing title to the city of as much land around the cedar as might be necessary for its safety. Thus was promoted a proposal that New York City officials include a small plot about its base in a park purchase program. Many garden and tree enthusiasts endorsed the plan in 1930 but it never materialized. Then until a barbed wire fence was built around it under the auspices of the Flushing Garden Club, rubbish was piled nearby and burned. Boys nailed cleats to the trunk to climb it. Branches were taken at Christmas. Riders packed the earth in a wide path across its roots.

Members of garden clubs and citizens interested in landscaping had long hoped to perpetuate this great tree, the first owner of which has never been definitely known. Proposals were made to propagate its seedlings for the beautifying of public parks and to aid in teaching biblical history. For cedar wood was used in building Solomon's Temple, and also by the Phoenicians in building the world's first ships on the Mediterranean Sea.

Tree lovers in this and foreign countries have traveled long distances to see this Great Cedar, as Pliny, the Roman naturalist, would have called it. As a specimen, it was regarded as the finest in the world. It had been measured periodically for twenty years by the late Everett P. Martin, who in 1921 nominated it to the Hall of Fame for Trees of The American Forestry Association. He found a steady growth. It had attained a height of more than sixty feet, and the spread of its branches exceeded seventy feet. The standard circumference at breast high measure was fourteen feet and ten inches. Just above the ground it was seventeen feet around.

At least three seedlings from the tree, successfully propagated in Flushing, met death also in 1934. Two others which had browned turned green again. The largest is about eighteen feet in height. Another specimen, eight to ten years old, has attained a height of five feet, having grown ten inches within a year.

Writers have assembled data on the life history of the *Cedrus Libani*, showing that sap flows twice annually from spring to fall, the two movements being separated by scarcely more than a fortnight in midsummer and each lasting about two months. The first sustains the growth of the tree. Evidently the second feeds the opening flowers and growing cones in autumn. The needles stand in bundles like stars, bright or dark green, sometimes bluish or silvery, massed so densely that they form a rich background for the large brown cones. Standing like goose eggs on end for months until they open, the cones discharge their scales which bear the seeds and leave long spikes standing in cups, sometimes for years.

Probably the only collection of cones, scales and seeds from the Flushing cedar, and mounted to show the cycle or life progress in propagation, was made by Mr. Martin. The mounted specimens were used in lectures at meetings of garden clubs, more than fifty of which possess gavels he fashioned from the wood. He obtained this from branches trimmed by tree surgeons.

There are three varieties of conifers belonging in the cedar family. *Cedrus Libani* heads the group. The family surname has been associated with an Arabic word "Kèdre," meaning power, and with the brook Kedron, in Judea, where these cedars once were plentiful. In size, however, they are outstripped by the *Deodara*, whose drooping pyramidal outline of

The Flushing Cedar of Lebanon, within its guard rails, and after the bolt of lightning had struck it. Photograph by the author.

light green adds color to the background of "eternal snow" in the Himalayas. These are the sacred trees of the Hindoos. Many of them have grown to heights of 150 feet, and one was found which measured 250 feet. They grow in this country in California and in the southern states. The Atlas cedar, or *Atlantica* group, found in Algeria, are smaller. They are grown in our eastern states as ornamental trees.

Specimens of Lebanon cedars were found in 1906 at the head of the Kadisha River, in Syria, to be eighty feet in height. One had a circumference of forty-seven feet. The largest was estimated to be from 1,500 to 2,000 years old. Natives tell of a belief that the grove was planted by Jesus, because of David's reference in the 104th Psalm, verse 16, to "the trees of the Lord . . . . the Cedars of Lebanon which He hath planted." That was accepted as prophecy and the grove therefore has been held sacred. But inroads have been made on the young cedars by hungry sheep and goats and irreverent men of all races, who destroyed the original forest.

The wood of the cedar has a balsamic fragrance, is fine-grained and of a pinkish hue. It is soft in texture, although harder in its homeland than elsewhere. Until a Cedar of Lebanon has attained great height its unusual table-top appearance does not develop. One has to learn to recognize the starry bundles of green needles to identify it, at least in its youth.

Everett P. Martin

The grand old tree of Flushing in the full height of its glory many years ago.

A compelling fascination has led many to try the propagation of Cedars of Lebanon, because of their history, their appeal to the imagination, and their use in original habitats as symbols of God. Hardy cedars have been grown since 1902 at the Arnold Arboretum, at Jamaica Plain, near Boston. These were grown from seed brought from the Cilician-Taurus mountains, Asia Minor. Last year there were under culture at the arboretum seventeen transplanted specimens of varying heights to fifty feet. The first cones grew on one of the trees in 1930.

Seed from this tree two years later produced forty-five young seedlings. Seed from another tree of the group, obtained in 1931, failed to germinate. Plantings made to include the spring of 1934 resulted in eighty-six successful germinations. The seeds usually ripen in the climate of Boston in December.

A few writers have made hobbies of sprouting the seeds and growing the seedlings. Among them was Evelyn, an English writer who lived shortly after Shakespeare. President James Madison was one of the first to introduce their culture in the United States, and on his former estate at Montpelier, Virginia, still lives a group he planted. His cedars received the attention of a young landscape gardener, said to have accompanied Lafayette on a visit to the Madisons in 1824.

Perhaps the most romantic adventure of any Cedar of Lebanon is told of one planted in a hat by Bernard de Jussieu, a French botanist, returning home aboard a ship driven off its course in a Mediterranean storm. He shared daily a half glass of water with the seedling when crew and passengers were put on short rations. The tree survived and was planted near Paris, where it reached a height of eighty feet. It was about 100 years old when cut down to make room for a railway.

The most recent experiment in transplanting in this country was made about a year ago last spring, when eighteen Lebanon cedars were received through the courtesy of the American University, at Beirut, Syria, by the Near East Foundation, New York City, as mementoes of good will. Twelve were planted in Arlington National Cemetery, and six were taken by the Department of Agriculture to a greenhouse for preservation. The largest was ten feet tall. Two were four feet in height and the rest were seedlings of six inches. They did not survive, however.

MOUNT HOOD ON SKIS

By STEWART H. HOLBROOK

A BLIZZARD roared into the Mount Hood National Forest, in Oregon, and above the timberline the firs bowed wildly before blasts that would keel a man over, while the heavy snowfall made night of high noon. Two boys were lost somewhere on the vast snow field, two young lads who had been exploring the mountainside on snowshoes.

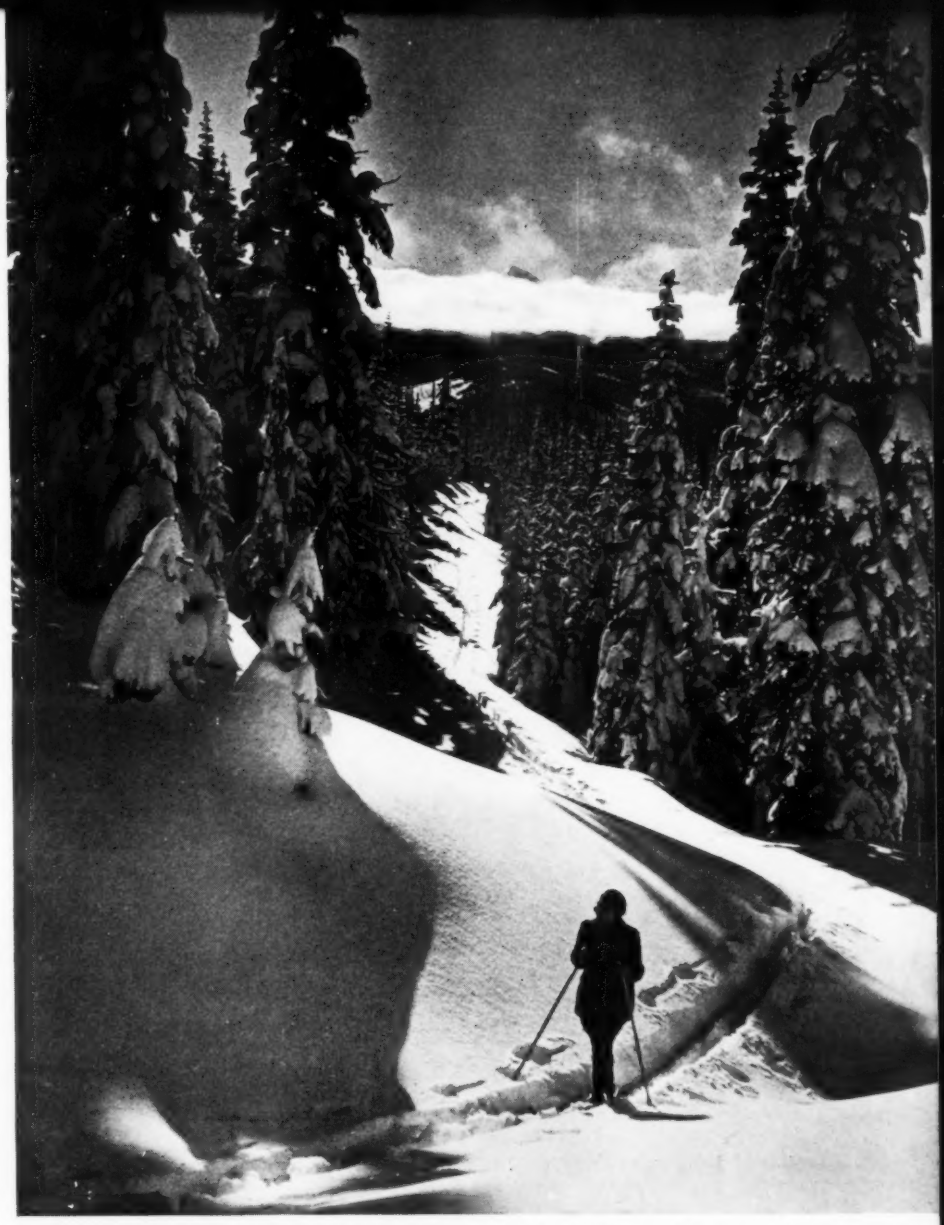
The forest guard station flashed the news to Portland, forty-five miles away, and the United States Forest Service went into action to raise searching parties and equipment. Men volunteered by the score, and then the Forest Service hit a snag. Not in Portland, nor in the surrounding country, could they muster 100 pairs of skis or snowshoes. The appeal went into the evening papers and it went over the local radio stations. To no avail. Here was a city of more than 300,000 persons in which there were not a sufficient number of either skis or snowshoes to equip a small searching party.

That was in January, 1927. Eight years later, in 1935, slightly more than 25,000 persons attended the winter sports carnival on the Mount Hood National Forest. How many pairs of skis and snowshoes there were in that big crowd, no man knows, but they were plentiful. Mahomet had finally moved in on the mountain. And the public, whether it knew it or not, had reason once more to be grateful to those "crank conservationists" who hounded long-past administrations into passing the National Forest Act of 1905, by which the Mount Hood area, among many others the country over, might retain its original and magnificent beauty.

It had long seemed strange and was often remarked upon by visitors to Oregon that almost no winter recreational use was made of the Mount Hood area by the people of Portland. Here was a great and natural park, open to the public and situated a little more than an hour's drive from a large city. There were woods and streams and lakes and crags and glaciers, and one of God's boulders that lifted its crested peak more than 11,000 feet above the sea.

It is true that many Portlanders used this playground in the summer months, although not as extensively as Mount Washington, in New Hampshire, is used by comparatively far away Bostonians and New Yorkers, but in the winter its broad ranges of white forest were scarcely marked by the sharp trail of ski or the webbed prints of a snowshoe.

Above the timberline on Mount Hood. Here the people have become "winter sports conscious"—Olympic tryouts have been held, and 40,000 skiers have assembled to watch them.



On the ski trail, in the Mount Hood National Forest. There are few, if any, great playgrounds in this country so ideally situated now for winter sports as Mount Hood—where for over a century few snowshoers were known and fewer skiers.

True enough, the hardy Crag Rats of Hood River knew the moraines and glaciers in their winter brooding, and other small groups of winter sports lovers went to the mountain when it was white. Yet how few they numbered may be guaged by the Forest Service's futile attempt to muster equipment for a searching party of one hundred.

Those days, however, are past. Portland, and the immediate surrounding country, has in the last eight years become what advertising agencies term "winter sports conscious," or, more colloquially, they have gone bughouse over skiing. Olympic team tryouts have been held on Mount Hood's slopes and more than 40,000 skiers, both embryo and emeritus, went to watch them. I do not know what is called a big crowd at Lake Placid, or in other playgrounds near large centers of population, but I do know that 40,000 is a whale of a crowd in Oregon. The crowd will probably be as large or larger when the Pacific Northwest Championship ski races are held on February 29 and March 1 of 1936; and for the fifth annual winter sports carnival, January 23 to 26, inclusive, the Forest Service and the Portland Winter Sports Association expect an attendance of 50,000.

The forest area will be ready. Working with the Forest Service, companies of the Civilian Conservation Corps have cleared 102 acres for skiing in the natural amphitheatre known as the Ski Bowl. Another eighty acres has been similarly cleared for general skiing on the North Slope, and twenty-five acres more at Nanitch Hill on the South Slope. A prepared ski-racing course stretches for two and one-half miles from a promontory called Tom-Dick-And-Harry to the Mount Hood Loop Highway. The Alpine Ski Trail ranges three and one-half miles down from the 6,000-foot elevation to Government Camp, at 3,875 feet. A ski-jumping hill has been prepared through the co-operative efforts of the Cascade Ski Club and the Forest Service.

The "movie-in" on the mountain was so sudden that parking of automobiles became a problem. Working together the Forest Service and the State Highway Department have prepared parking space for 4,000 automobiles along the Mount Hood highways, and there are other parking areas that will be kept open. All will be needed this season. Toilet facilities, always an important item and especially so in a winter sports area, have been greatly enlarged this past summer and now, for the first time since the crowds began moving in, they are adequate. There are bound to be accidents where there are sports, so the Portland Winter Sports Association now maintains a first-aid station at the Cascade Ski Club's clubhouse, and there is another at the headquarters of the Wy-East Climbers. The Forest Service has similar stations at two points on the area.

Radio is playing a part. From short-wave Station PF-153, at Summit, the Forest Service sends reports twice daily to Portland, where they are broadcast. Reports cover depth and condition of snow, temperature, wind, skiing conditions, and also whether or not automobile chains will be needed on the way to the forest. At 4 P. M. on Fridays, these winter days, and at 8 A. M. on Saturdays, it would appear that a goodly portion of Portland was tuned in on its favorite local station to learn the conditions of things at its new winter playground. Newspapers print the reports as front-page news, which they are.

It is a fact that there are a few, if any, great playgrounds in this country so ideally situated for the use of man as is the Mount Hood area. You enter the National Forest

forty-three miles, and one hour and ten minutes, from the heart of downtown Portland. The highway is fair and broad, and in winters of late years the State Highway Department has kept it clear of snow—snow that in places rises in great high banks on both sides.

It is not only possible, but eminently pleasant and convenient, to have breakfast in Portland, drive to the mountain, ski or snowshoe in an Alpine terrain and atmosphere, and return to the city in plenty of time for supper—with roses picked from your own yard on the table. But this is not a treatise on climate; you'll hear enough, and probably too much about that any time you get west of the Cascade Mountains.

There is plenty of colorful history connected with the Mount Hood area which little concerns the winter sportsmen. But they really ought to know that the present highway to the mountain generally follows the old Barlow Road, over which the oxcarts of pioneers creaked westward, to be followed later by the military to be used against savages who thought foolishly and vainly they had divine rights to the lands they roamed.

Not every ski enthusiast who strikes up the ski trail from Government Camp this winter will know whence came that name. According to Francis E. Williamson, Jr., of the Forest Service, who among other things is the unofficial historian of the area, Government Camp was so called from the time when a sergeant and four men of the United States Fourth Field Artillery, together with eighty-odd mules of that gallant regiment, camped there during a blizzard. The blizzard dispersed the mules, and the soldiers later went on their way to Fort Vancouver, leaving behind all their equipment and a sign that warned "Hands Off, Government Property." That was back in Indian war days and the name has stuck. The postoffice is Government Camp, but the township is Pompeii, long forgotten, since the mountain never blew off its top. In passing it might be mentioned that Mount Hood itself was named in 1792 by Lieutenant William R. Broughton, of the British navy, in honor of an English admiral and nobleman of the time, for Oregon and Washington were long British territory in name, and territory of the British Hudson's Bay Company in fact.

Ski jumping on the heavily snow-blanketed sides of Mount Hood. Many thousands turn out now for the ski-jumping and racing events,—since the public discovered skis and the National Forest.

Thus, for nearly a century and a half Mount Hood knew few snowshoers and even fewer skiers. It is not possible to place an exact date on which the mountain first began to attract winter sportsmen in numbers, but Forest Service officers who have lived on and around the peak for many years, say that they had few visitors during winters until 1927, when skis and snowshoes had to be imported to equip a searching party. Nowadays, the Forest Service men have to watch their step on (*Continuing on page* 92)

CHARACTERS IN WOOD BRING THE OLD WEST TO LIFE - - - By E. L. TURNER

"Cowboy on Horse"—A hard-riding cowpuncher of the Old West, on his half-wild steed, lives again in this graphic wood carving.

Andy's Indian "trade-mark" —a full-sized figure.

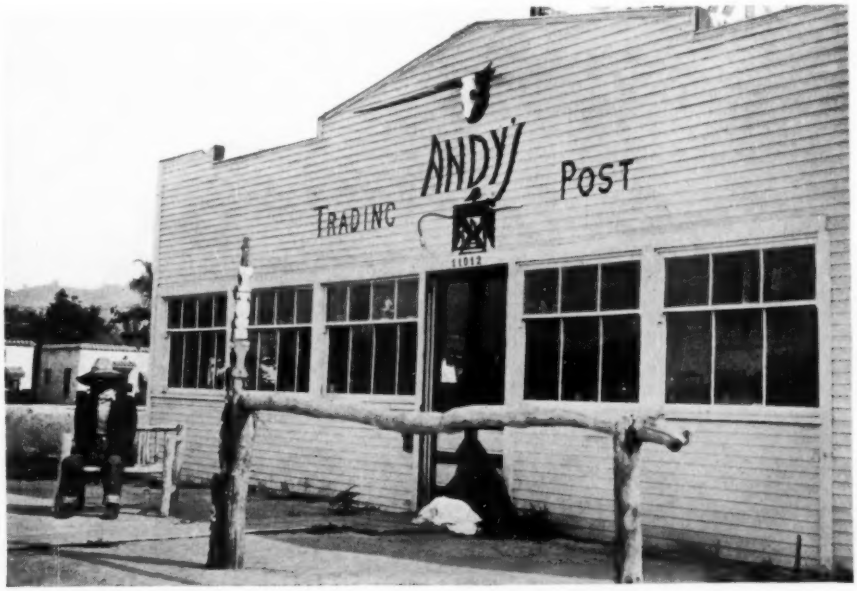
OUT in the hills north of Hollywood, in California, travelers speeding over the wide highway are greeted by the sight of an Indian sitting near an old-time hitching rail in front of a small building that seems to belong to an early frontier town. Those who stop for closer inspection are surprised to discover that the life-sized costumed Indian is made of wood.

The Indian on the rustic bench is the special "trademark" for Andy's Trading Post, one of the most unusual shops in the West, where artistry in wood is featured and where every article sold is made of wood. The store was established three years ago by Herbert S. Anderson, once a Colorado cowboy with a hobby for whittling, then an expert carpenter, and finally an artist who creates characters of the West out of wood. Glimpses of the many strange objects through windows of the Post invite the visitor to pass inside, beneath the horned skull that guards the doorway. There the Old Western atmosphere is greatly intensified. Indians, cowboys, horses of all sizes and descriptions are everywhere, and pioneer history is re-enacted on rustic tables and in display cases.

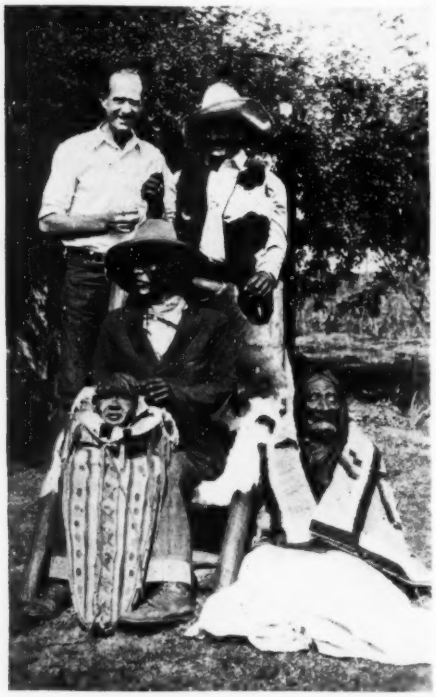
Indian relics—colorful blankets, wampums, peace pipes, skins, and beadwork—which Mr. Anderson has collected from everywhere, line the walls. These curios are not for sale, but serve to form a setting for the carved curios in this veritable museum of wood. There are hard-riding cowpunchers spurring on half-wild steeds, befeathered Indians astride saddleless ponies, early settlers in covered wagons drawn by plodding ox teams. Scenes and figures, with all the action and movement of western pioneer days, yet only small stationary carvings of wood.

Life grows out of wooden blocks under Mr. Anderson's knife. One of his best cowboy poses was chosen for the art museum exhibit at Exposition Park in Los Angeles. Other pieces of his work are in demand for western celebrations and fairs. Several motion picture studios purchased some of these wooden portrayals to use as miniatures in model and test sets, or in actual movie scenes. One of Andy's covered wagons and a horse and rider were seen on a westerner's desk in the production, "Wyoming."

A complete town of the early West, containing one hundred and fifty separate figures, is a



Andy's Trading Post—one of the most unusual shops in the West, where artistry in wood is featured and every article sold is made of wood.



Andy with a typical group of his "characters in wood."

rather than the soft white basswood necessary for the smaller figures. Andy's most interesting studies in relief are of characteristic Indian scenes—the snake dance, the smoking of the peace pipe, the speaking of the sign language, and the council fire. Character studies are also portrayed in life-size profiles, especially of the picturesque Navajo people of the Southwest. Then there are full-size figures, like that of Andy's trademark Indian, with carved heads and hands, and dressed in real clothes. Although the carver refuses to sell his trademark, he has made other Indians on a like scale. Recently, he has added a small group of Mexicans to this life-size family.

Keen-edged knives, which the artist himself makes out of old razors, are his only implements. He uses no glue; each of the subjects is carved from one piece of wood. Even the tops and wheels of the covered wagons are cut from solid wood. The originator of these amazingly life-like representations in wood once tried painting the figures, but the colors obscured the delicacy of the carving and destroyed the statue-like effect. Such painted miniatures, he reasoned, might just as well be glued together and made of many pieces of wood, for the finished work would appear the same. So all of the objects, except caricatures, are left unpainted, with their natural wood finish.

These caricatures are another distinct and interesting phase of Andy's carving. These are larger figures, on a scale of three inches to one foot, painted in the brilliant colors typical of Indian and Mexican costumes. In this collection are Indian bucks and squaws, a squint-eyed old sheep-herder, a Mexican by a border post, a caricature of Will Rogers as a cowboy, and other amusing subjects.

A wealth of characterization distinguishes these comics, in which certain aspects are emphasized with humorous effectiveness. Expressive lines in a face, a rip in a coat, a missing tooth, the insolent tilt of a sombrero—every significant detail is included.

As a youthful cowboy on the Colorado ranges fifteen years ago, Herbert Anderson spent his leisure moments sitting on corral fences whittling out likenesses of his pals and their broncs. In fact, his knife and talent were feature of one exhibit—undoubtedly the best work Andy has turned out. Along the street are a stable with saddles and harnesses hanging outside and with horses within, resting or feeding in the stalls; a blacksmith shop with the smith working at his anvil; a general store with a high false front; an old-time saloon complete even to a stove, framed pictures on the walls, and a broom in the corner; horses and wagons by the hitching posts; a cabin with kettles and frying pans hanging on the exterior walls. The inhabitants of this town are going about their daily life—one man washing his face outdoors in a basin, another drawing water at a well, and a shooting brawl taking place near the saloon. Mountains loom as a background.

Old pioneers who have viewed this scene—and it has lured many of them—exclaim over its authenticity and completeness. Every part of the exhibit is made entirely of wood, even to the men's spurs and revolvers. The figures are carved on the minute scale of half an inch to represent one foot. More than a day's work is required to complete the three-inch figure of a man.

Some of the carvings, finished in greater detail, are two or three times larger. One of the most delicate and beautiful groups is that of a doe and two fawns. Even the spots on these animals are made visible by the intricate carving. An old prospector leading his horse is a piece alive with character. Others are a Mexican ready for a cock-fight and a cowboy rolling a cigarette while he holds his tobacco pouch in his mouth by its string—a really remarkable bit of carving.

With keen-edged knives, fashioned from old razors, the artist carves from solid wood such characters of the Old West as Indians, cowboys and Mexicans.

More detailed facial expression is possible in the larger reliefs, which are chiseled out of hardwood,—redwood, or mahogany,

Andy's caricatures are an outstanding part of his art. Here a squint-eyed old sheep-herder foregathers with the beloved Will Rogers.

with him wherever he was—on the range, during roundup, wherever cowboys gathered for work or for play. As a result, he achieved something of a reputation as a wood carver wherever his trail led. Later on, when he surrendered rope and spurs for the tools of the carpenter and contractor, he continued his carving—but still as a hobby. It was during this period, however, that he attained an astonishing adeptness in investing his wooden creatures with human interest and reality.

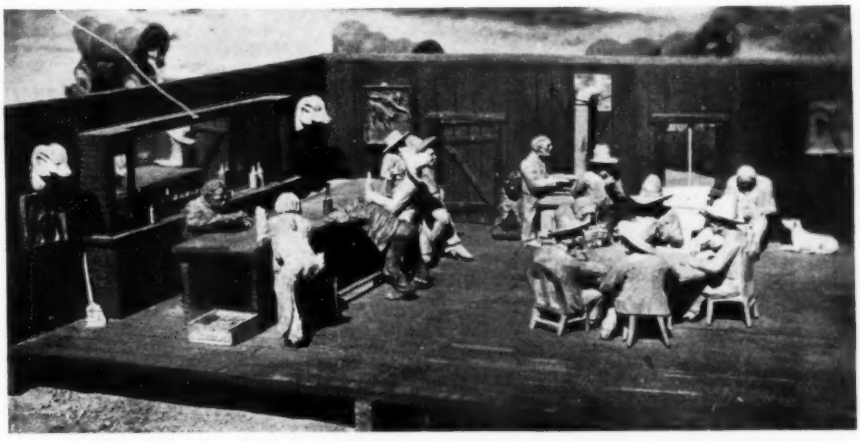
It is not at all strange that his carvings, after leaving the range, should continue to portray cowboys, cow towns, horses, Indians and other phases of the Old West. Andy is a son of the range, and its phases, its characters, its color are so much a part of him it is only natural that he should dedicate his art to keeping the Old West alive through characters in wood. All told, more than a thousand figures have been "whittled" from wood blocks.

On a recent trip back into the Indian country of New Mexico and Colorado, Andy studied the lives and customs of the redmen in greater detail. He now plans a new series of Indian characters to embrace new ideas and impressions.

One of his recent exhibits in Hollywood attracted hundreds of people — people from all parts of the country. Tall, lean, sunburned, in the wide-brimmed hat, chaps and riding boots of the range he knows and loves, Andy might well have been the original cowpuncher of one of his carvings before transformed into miniature. To those who are sincerely interested in his art he is ever willing to explain or demonstrate his process. His knowledge of wood — particularly western woods — is profound. And naturally, trees are like brothers to him.

His Trading Post, probably the only shop of its kind in existence, is a picturesque phase of the western revival of wood carving in art and architecture. And what could be more appropriate than perpetuating in wood the native tribesmen of the great western forests and the pioneers who opened these vast wildernesses to civilization?

A beautiful study is this covered wagon. The artist uses no glue, for each carving is all in one piece. Even the tops and the wheels are cut from solid wood blocks.



One of the features of a complete miniature town of the early West, wholly carved from wood, is an old-time saloon complete with stove, spittoons, framed pictures and a broom in the corner—even the inevitable mongrel dog appears.

One of the most delicate and beautiful of the larger studies is this carving of a doe, with her two fawns, the detailed and intricate carving even bringing out the animals' spots.

Louis Agassiz Fuertes

The Banner-Tailed Kangaroo Rat, with proportions somewhat like those of a Kangaroo, gets his common name—banner-tail—from his long and attractive tail, done in black and white and ornamented at the end with a black brush tipped with white.

THE BANNER-TAIL AND OTHER BURROWERS

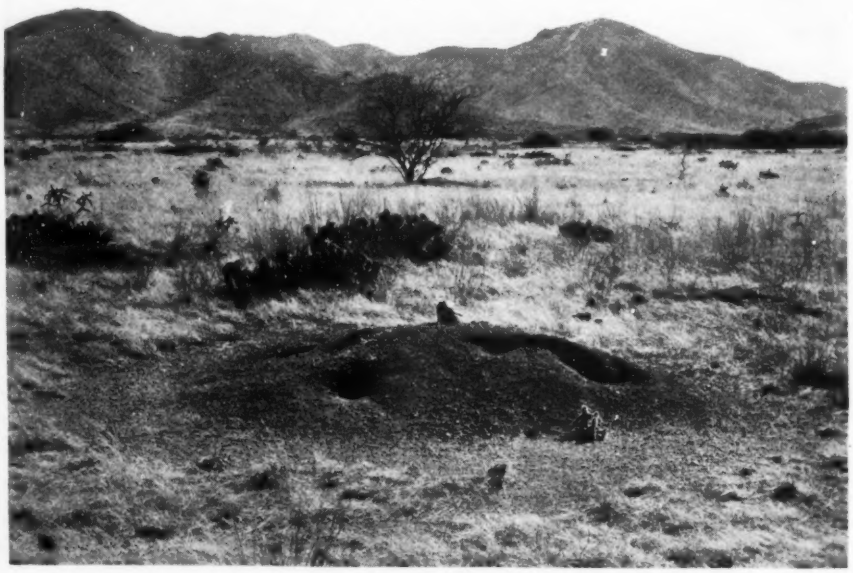
By WALTER P. TAYLOR

Photographs by the United States Biological Survey

ONE time I held a banner-tailed kangaroo rat captive in a box in the headquarters cabin at the Santa Rita Range Reserve, near Tucson, Arizona. In the evening, wishing to examine him more closely, I opened the box slightly. Quicker than light he emerged and was free in the room. After him I went, trying to get him back in the box. Wherever I grabbed, however, Mr. Banner-tail simply was not there. When I reached for him on the floor, he was high in the air, and when I stood erect to catch him on the fly, he was on the floor. The way he bounced about, he might well have been made of rubber, for leaps of five or six feet were made with ease.

A small animal, his body about the size of a half-grown guinea pig, with long hind legs, short fore feet, and a balancing tail, the banner-tail is nothing if not nimble. He is one of America's biggest and showiest species of the *Heteromyidae*, a family of rodents characterized, among other things, by the possession of capacious external cheek pockets, and legs and tail proportioned somewhat like those of a kangaroo. His common name, banner-tail, is derived from the animal's long and attractive tail, done in black and white, and ornamented, at the end, with a black brush tipped with white.

As one motors over the Arizona desert roads at night, the headlights often afford tantalizing hints of the little-known night life of the great quiet spaces. Jack rabbits, of course, are not infrequent. Occasionally one may see bobcats or coyotes. Once I saw a handsome skunk, dancing along ahead of the car. Rodents of a number of species are in places very common. The smallest is a tiny pocket mouse, weighing perhaps half an ounce. There are at least three kinds of these mice which may be observed in the vicinity of Tucson. A little larger are the Merriam



This is characteristic banner-tail country—the southern semi-desert lands from western Texas all the way to western Arizona. Here its range meets that of the paler big desert kangaroo rat. This is a typical banner-tail den, a portion of which has caved in.

kangaroo rats, named after Dr. C. Hart Merriam, first chief of the United States Biological Survey. The Merriam kangaroo rats often appear to be the most abundant of desert rodents. None of these creatures, however, is more attractive than the banner-tailed kangaroo rat, the markings of which are fairly conspicuous, permitting the observer to identify it even in the subdued lights of the automobile.

The banner-tail is a characteristic denizen of the southern semi-desert lands from western Texas all the way to western Arizona, where its range meets that of the paler big desert kangaroo rat of far western Arizona and the adjoining arid lands of California. Its occurrence is marked by conspicuous mounds of earth, each mound with several large round holes leading to its interior. The traveler's first thought is of prairie dogs, but the burrow entrances in prairie dog towns are more like a series of shallow craters. The dens of the banner-tail are often fifteen feet in diameter and two or three feet high, exemplifying a prodigious amount of industry. The holes average four inches in diameter, much larger than one would think necessary for a small animal like the kangaroo rat. The size of these holes puzzle at first. It has been found, however, that the banner-tail moves almost entirely by hopping on his hind feet, scarcely ever getting down on all fours at all. Since he has to hop into his den, the doors must be large enough to admit him standing up, as it were.

Courtesy New York Zoological Society

The large Kangaroo Rat is found in western Texas and parts of Arizona and New Mexico. Confined to arid regions, it is a handsome, cleanly animal, burrowing and nocturnal in habits, with a length of about fourteen inches. They are true rodents but look like miniature kangaroos, and in moving about take long, flying leaps, using the tail as a balancing organ.

I often amuse folks not familiar with the habits of banner-tails by knocking at the rodent's doors to see if they are within. By scratching gently on the "threshold" of any of the prominent openings, one can often get an answer from within, a purring sound, made by the rapid beating of the kangaroo rat's hind feet on the ground. Whether the sound is a warning or an indication of fear or merely a courteous reply to the visitor's signal is not known. But it is a sure sign the owner is at home.

Beneath the surface the banner-tail's den is an irregular maze or even labyrinth of passages and rooms, from two to four stories "high." At the appropriate time of year a considerable quantity of grass or weed seeds, stems, or crowns is stored in the den. I found the average weight of material stored was about four pounds a den a year. Near Albuquerque, New Mexico, Dr. Charles T. Vorhies, of the University of Arizona, found more than thirteen pounds of grass seed, the largest amount of stored material ever excavated from a single kangaroo rat den, so far as is known. In one of the Santa Rita dens the number of separate cut pieces of grass ran seventeen to the gram, at which rate there were at least 27,000 grass crowns stored in this one burrow. A count of two grams of the material taken from the Albuquerque den showed 125 separate cut sections per gram, or a total of some 680,000 pieces in the burrow. The banner-tail is a strong candidate for the world's record for storing activity, at least at certain seasons.

The swing of the seasons in this semi-arid country is such that for long periods of time suitable food for the kangaroo rat is not available. It is deserving of comment that the kangaroo rat, like the Indian, has achieved a fairly successful solution of the food problem even under these difficult conditions, with no help from railroads or other methods of transportation to bring products from a distance.

A number of other animals make free use of the home of the banner-tail. Whether they are invited guests is doubtful. They probably correspond more closely to the house mice and Norway rats that afflict the dwellings and stores of mankind. They include the Merriam kangaroo rat; the round-tailed spermophile; the antelope squirrel; the scorpion; the Gila monster; the banded gecko; and various other creatures, snakes, lizards, and insects. All are interesting to the observer, but it is not likely that they form a happy family. However that may be, there is, in the den, a miniature world, a microhabitat, with numerous organisms living and loving and being born and dying. If the ebb and flow of the biological forces, the community relationships of the denizens of the kangaroo rat den could be understood, who knows but what mankind might well be on the road to the solution of some of the problems of human sociology, psychology, and even philosophy?

One night I caught two banner-tails on each of two dens —an unusual occurrence, since but one animal is usually secured at a den. Sometimes I found banner-tails missing in my traps when I was pretty sure they had been caught. Scattered fragments of a banner-tail near the home mound with the tell-tale droppings of a desert fox nearby, the droppings largely composed of kangaroo rat hair, told a perfectly readable story. Other desert dwellers known to consume banner-tail meat whenever they can get it are the badger, bobcat, coyote, and western horned owl. Even the Papago Indians, who are among the most expert desert

dwellers among humankind, formerly used the kangaroo rat as food.

In one respect the banner-tail and his fellow-burrowers have far out-distanced mankind. I refer to their very sensible adaptation to the hot and cold of the desert. This accommodation is not through any conspicuous physical structure, as in the case of so many plants, but rather through the habit of living below the surface of the ground. For the kangaroo rat avoids the heat of summer, and indeed, the

The young and nest of the Kangaroo rat. There are two young ones here, which is the usual number in a litter.

chill of winter, by seeking a stratum of moderate climate in the soil. It is well-known that as one digs into the surface layers of the soil, say down to six feet, there is less and less immediate effect of the surface climate. My own basement in Tucson, Arizona, for example, is precisely ten degrees cooler than the rooms on the ground floor of my house. There is a judge living in the city who is said to have his study and library entirely below ground. Most people, however, set the whole of their houses on the surface, where they tend to become hot boxes in summer and refrigerators in winter. By seeking an appropriate underground level the banner-tail is able to dwell in a very equable climate, comparable, perhaps, to that of the California coast, while the surface above him is subjected to enervating extremes. The nocturnal habit of the animal saves him too; for he only emerges from his stronghold when the fierce heat of the sun has passed, and the cool breezes of evening are flowing slowly down over the mesas from the mountains.

The numbers of kangaroo rats are relatively not large. Perhaps two to an acre would represent an average on the 50,000 acres of the Santa Rita. This would make 100,000 for the Reserve as a whole.

Burrowing rodents of all kinds, not counting woodrats, are figured, very conservatively, at 2,000,000 on the Reserve. Nor are rabbits included in this figure, although they are extremely abundant.

I may now make some suggestions as to the economic status of the rodents, although the unknowns in the various equations will compel me, for want of something better, to resort to estimates and to give somewhat free reign to supposedly scientific imagination.

First, as to the number of rodents. It has been noted that approximately 2,000,000 is the estimated number of rodents, not including rabbits, on the 50,000 acres of the Santa Rita. According to a recent encyclopedia the area of the State of Arizona is 72,931,840 acres. At the rate of rodent occurrence on the Santa Rita there would be no less than 2,912,000,000 individual rodents in Arizona alone. There are, however, extensive areas, embracing especially the brush-lands, the woodland types, and the more extreme desert regions, where rodents are considerably less abundant than they are on the Santa Rita. Allowing for these areas of lesser population, and taking only one-fourth of the number given above, there still are 728,000,000 individuals. It is not unlikely that 1,000,000,000, plus or minus several million, is near the total rodent population of the State, surely a grand total that is impressive.

What does this host of rodents mean for the welfare of the people? Unfortunately this question cannot be categorically answered. Take the kangaroo rat, for example. About the dens of the species,

The same two youngsters shown above, when they were about two weeks old. The pelage is short, but has the white markings characteristic of the adult; the tails are relatively short and with scarcely any hair.

a circle with a radius of from five to fifty feet, more or less, grazed over, occasionally pretty well denuded of vegetation, can be made out. So serious have the depredations on forage of the banner-tail been assumed to be that extensive control campaigns have been waged against the species on both the Santa Rita and the Jornada Range Reserves.

There is another side of the story. The banner-tail, as already intimated, is one of the most active of the subterranean burrowers. At least two cubic yards—and usually many more—of earth are transported, worked over, mixed with the remains of plants and (*Continuing on page* 93)

THE CRYPTOMERIA OF NIKKO

By WILL C. BARNES

"NOWHERE is there a more impressive group of trees than those surrounding the temples and tombs at Nikko." So wrote a noted forester after a visit to Japan. Consequently, when a visit to Japan was planned, Nikko was on my "must" list of places to be hunted up and inspected.

I found it a charming little hamlet beside a rollicky mountain stream that dashed noisily along to the sea, like many streams in America's Rocky Mountains. Directly opposite was a great range, heavily forested. On the side of this mountain was the tomb of one of Japan's noted Shoguns, as well as several native temples. The Shoguns were that group of military rulers who, centuries ago, usurped the powers of the Japanese Emperors and ruled for many years.

In the Seventeenth century when the Shogun Ieyasu, founder of the Tokugawa dynasty, was laid to rest in the Nikko Hills, the Shogun who succeeded him called upon all the subrulers to send a stone or bronze lantern to decorate the grounds about the tomb.

One individual sent word that he was too poor to provide a lantern, but offered instead to plant cryptomeria trees beside the road leading to the tomb so that visitors might be protected from the sun. His offer was accepted and so popular was the idea that others followed his lead. Today a line of giant cryptomeria fences both sides of the road from the mountain at Nikko almost to Tokio. Moreover, others planted these trees on the mountain in the vicinity of the temples and tombs, until now they are embowered in a perfect forest of cryptomeria.

Cryptomeria trees at Nikko, around the Tombs and Temples of Japan's ancient Shogun rulers.

The priests of today to whom these trees belong see to it that whenever a tree dies a young one is planted in its place. None are ever cut and when one dies or, as often happens, is blown over by a storm, it is cut up by the priests with great care and skill and every piece sold for wood carving purposes. By this same token, Nikko is celebrated as the wood carving center of Japan.

On the grounds around the tomb, one is shown the original carving known the world over as the "Three Apes"—those animals "who see no evil, hear no evil and speak no evil." They are carved on a thick slab of cryptomeria wood, about fifteen feet long and three feet wide. The approach to the tomb and temples is up a series of stone stairways with fine balustrades all carved from solid rock. On both sides (*Continuing on page* 92)

PHILIP W. AYRES, FORESTER

Veteran Conservationist, in Retiring, Leaves Green Monuments in the Hills of New Hampshire, Which Speak a Life of Accomplishment in Directing the Work of the Society for the Protection of New Hampshire Forests

By

K. W. WOODWARD

UP to about 1900, the woodlands of New Hampshire had for 300 years been culled for sawtimber and firewood. Farmers, cutting for their own use or to sell to small sawmills on the drivable streams, harvested trees here and there so that little change appeared in the tree-clad hillsides. But the coming of the paper mills changed all of this. They demanded thousands of cords of pulpwood annually; and they seemed to have a supply of the best raw material in the pure stands of spruce on the upper slopes of the mountains of New England. Hence, logging was organized on a large scale, cutting was clean, and the logged-over areas were not worth taxes. In fact, so useless were they regarded that they were usually allowed to burn over. And what hot, devastating fires they were with the great accumulations of dry limbs!

But such waste stirred up protests from other users of the woodland. And even though they possessed no legal rights because they themselves were, in fact, trespassers, they could arouse public sentiment to their cause. Too, they could bring pressure to bear on the summer resort keepers who took their vacation money. But it was a long and bitter struggle with the weight of the law and the common sense of the community on the side of the loggers. Could not a man do what he wanted with his own land, and were not trees made to cut down?

Philip W. Ayres

Then entered Philip Wheelock Ayres, trained in correcting evils by getting people to work together. He knew also the value of woodlands in community well-being when their various uses did not interfere with each other. A graduate of Cornell in both philosophy and forestry, with post graduate work at Johns Hopkins in sociology, Mr. Ayres had devoted a dozen years to philanthropic work in Chicago and New York, and had been secretary to the commission President McKinley sent abroad to study prison reform. So the small group of New Hampshire and Massachusetts citizens who organized the Society for the Protection of New Hampshire Forests in 1900, secured in him an expert in making people and trees work together for the common good. Added to this were the high standards drilled into him in his boyhood minister's home, his tireless energy, and the active understanding of Mrs. Ayres. Results, of course, followed. The fight for the Weeks Law gave him his opportunity in the national field. He did yeoman work in bringing about this first great forestry legislation.

The most tangible immediate testimony lay in the creation of the White Mountain National Forest, — 1,000,000 acres managed by trained men so that the lumberman may cut, the hunter shoot, the angler fish, the motorist ride, the camper tent, and the hiker gaze at unspoiled scenery, all without getting into each other's way. This didn't come easily. First it was necessary to make articulate in New England the idea that trees were made to look at as well as cut down, convince Congress of the necessity of setting up Federal legislation, train men to manage the forest, and keep together a privately financed organization to hold up the hands of foresters. Of course, other men helped. The list is too long to give here. But it was always Philip Wheelock Ayres who was never discouraged, who thought out new methods, and who knew what to do next.

Besides being mainly responsible for the most important National Forest in the eastern United States, Mr. Ayres achieved other results, less tangible, perhaps, but to many more enduring. He demonstrated how to keep together a private society for public welfare, build up its endowment, and even launch it successfully in running a business which has to meet the ordinary commercial standards of keeping solvent and at the same time construct buildings, trails and lakes that are of permanent public benefit. Lost River and Franconia Notch are notable examples of how this can be done.

Then, too, the New Hampshire State Forestry Department owes much to Mr. Ayres. His contribution to its development is well known. He assisted other states at the same time, for the state forestry department movement has been one which has grown by mutual (*Continuing on page* 92)

EDITORIAL

The Wildlife Conference

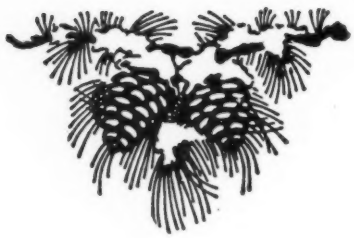
PRESIDENT ROOSEVELT has rendered a timely service in calling the North American Wildlife Conference in Washington, February 3-7. "My purpose," he said in issuing the call, "is to bring together individuals, organizations and agencies interested in the restoration and conservation of wildlife resources. My hope is that through this conference new cooperation between public and private interests and between Canada, Mexico and this country will be developed; that from it will come constructive proposals for concrete action; that from these proposals existing state and federal governmental agencies and conservation groups can work for the common good."

So critical is the state of many of our wildlife species that the conference should command the interest and support of every man and woman, boy and girl who would see birds and wild animals continue as a living part of the North American outdoors. The occasion offers the American public a rare opportunity to forward conservation in the wildlife field in somewhat the same way it was forwarded in the forest field by the Forestry Congress called by The American Forestry Association in 1905 and by the Conference of Governors called by President Theodore Roosevelt in 1908. Wildlife has been called the stepchild of conservation. Here is the opportunity to take it into the family and give it the national birthright it so richly deserves.

Of all our natural resources, wildlife has the greatest human appeal. It enters into the social and economic life of the country in a large way. The meeting therefore should be the most important conservation gathering of the year. Many species of our birds and animals are approaching extinction. Past efforts to turn back the tide of destruction have failed. The future of American wildlife is still uncertain, chaotic, and in the case of numerous species it hangs in the balance. While wildlife conferences in the past have been of great value in revealing the situation and bringing to the front the more critical problems to be met, programs of wildlife protection and restoration have invariably been grounded by barriers of political opportunism and by warfare among wildlife groups themselves with the result that public interest and confidence have been decimated. The February conference must be different. If it is to avoid passing into history "as just another conservation meeting," its results must stand as a magna charta of American wildlife restoration—a fearless, clear-cut program of principles and actions that will arouse the united and fighting support of wildlife advocates throughout the North American continent.

The forming of a national federation of wildlife conservation will occupy an important place in the program of the meeting. The object sought is to provide the organized machinery wherewith "to make effective the potential strength inherent in the advocates of wildlife conservation and restoration and to apply it against the forces of waste." It is to be hoped that the proposed federation will be built upon a permanent and lasting foundation. This calls for the laying aside of all rivalries, pet programs and group interests and general acceptance of a common program based upon the real needs of wildlife. It will be unfortunate if enthusiasm for the organization of a federation serves to minimize or relegate to the background the drafting and adoption of a wildlife constitution upon which the proposed federation must stand before the country. If its constitution and program of action are right, the federation will prosper, gain strength and render a great national service; if weak, evasive or equivocal, no amount of organizing will preserve it. It will go the way the wild ducks are now going.

FIELD AND FOREST FOR BOYS AND GIRLS



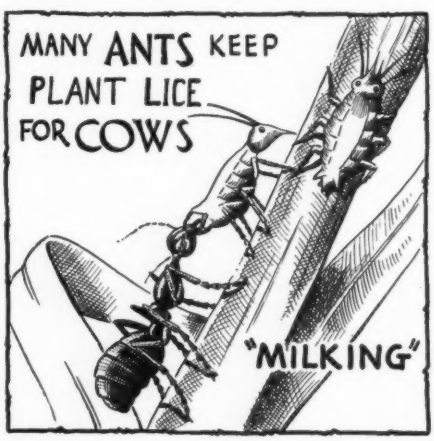
ANIMAL PROFESSIONS

By JOHN HARVEY FURBAY, Ph. D.

Illustrated by William D. Vennard

ANIMALS are confronted with many of the same problems as man. They live on the same earth, and are subject to the same laws, dangers, and necessities. They have preceded man in solving many problems, and from them, man has learned much.

Agriculture is a fundamental industry to man. It is likewise fundamental to animals. Our cultivated crops came along after our little animal friends, the ants, had been raising gardens of fungus for food. This fungus is grown on bits of leaves in the nest, and is never allowed to fruit. The fruiting heads are bitten off as soon as they show up. The ants live entirely on this fungus. When the queen leaves to start a new nest, she takes some of this fungus in her mouth, and uses it to start a new garden.



The dairying industry is associated with agriculture. Long before men kept cows for milk, ants were operating extensive dairies. Their "cows" are found grazing today on many of the shrubs of our lawns. They are the familiar plant lice or aphids. The ants care for these little insects, feeding them, protecting them, and housing them, in order to get from them a sweet secretion they desire for food. This secretion is obtained from two tiny openings at the back of the abdomen, while the ants stroke the rear feelers of the plant lice. Little stables are built by the ants, so that the plant lice may be imprisoned until "milked." After this, they are again pastured on their favorite plants.

There are many engineers in the animal world. Human engineers struggle to build bridges across chasms of a continent, but some of our animal acquaintances have successfully attempted the task of building new continents where there were none before. These animals, called corals, slowly working on the bottom of the ocean, have quietly and steadily built up the ocean floor until great chains of islands have been produced. Some lands which have been produced in this way are the Fiji Islands, Bahama Islands, Florida Keys, and the Great Barrier of Australia, which is over 1,100 miles long.

Other feats of engineering skill are shown by the nests and villages of certain animals. The nests of the tree-termite of France are all laid out in definite streets and canals. The ventilation systems of many nests are remarkable, especially in the case of bees. Certain workers fan the hive with their wings with great efficiency.

Many animals are good weavers. Spiders construct their webs on complicated geometrical patterns, and with delicate materials. Caterpillars spin miles of silk, and construct their homes with it. The nest of the weaver bird is made of leaves sewed together with grass.

There are many telegraph operators in the animal world. The "dots and dashes" of the click beetle are well known. These sounds are code messages to other beetles. Woodpeckers and woodcocks tap out their codes on hollow logs and trees, and listen for distant replies. Ants communicate their messages by touch. They talk to each other by sets of "taps" on each other's feelers. Watch when two ants meet and you may observe this.

Electricians have been in the world for ages. The electric eels are able to generate charges of electricity within their bodies, and to kill their victims with electrical shocks. They may discharge a 400-volt shock at one time. The electric catfish is able to shock another fish just enough to make this fish sick. The shocked fish then vomits up its last meal, which the electric catfish devours.

Surgery is practiced by wasps and spiders which administer anesthetics to paralyze their victims. They do not kill their prey, but inject this anesthetic into the nerve centers of the victims. This is the forerunner of the modern anesthetics injected in the spine now used in our hospitals. It is interesting to note that these

wasps and spiders know exactly where the nerve center of the victim is, and they always strike it the first time they try. This seems to be a part of their instinctive behavior.

Undertaking is the chief occupation of the burying beetle, which digs into the ground and buries various small animals. These carcasses serve as food for their young beetles which hatch from eggs laid nearby, or in the dead bodies. Wasps also bury their paralyzed victims and deposit eggs in them in a similar way.

Architects are plentiful. Many animals build structures of great elegance and complexity, perfectly suited to their needs. Warrier-termites, at the Cape of Good Hope, construct nests twenty feet high, with rooms large enough to shelter a dozen men. If our own houses were as large in proportion to our size, they would be four or five times as high as the pyramids of Egypt.

Among the insects, one can find masons, upholsterers, paper makers, joiners, under-water builders, weavers, and carpenters. Homes are built from various substances, and great skill is shown in the construction.

Slaveholding is practiced by many ants. They capture other ants, and hold them as slaves, to do their work. Huber, the naturalist, told of slave ants in Switzerland, opening the gates of the colony at daybreak, and closing them at night or in case of rain. Slaveholding ants are often entirely helpless if their slaves are all taken from them.

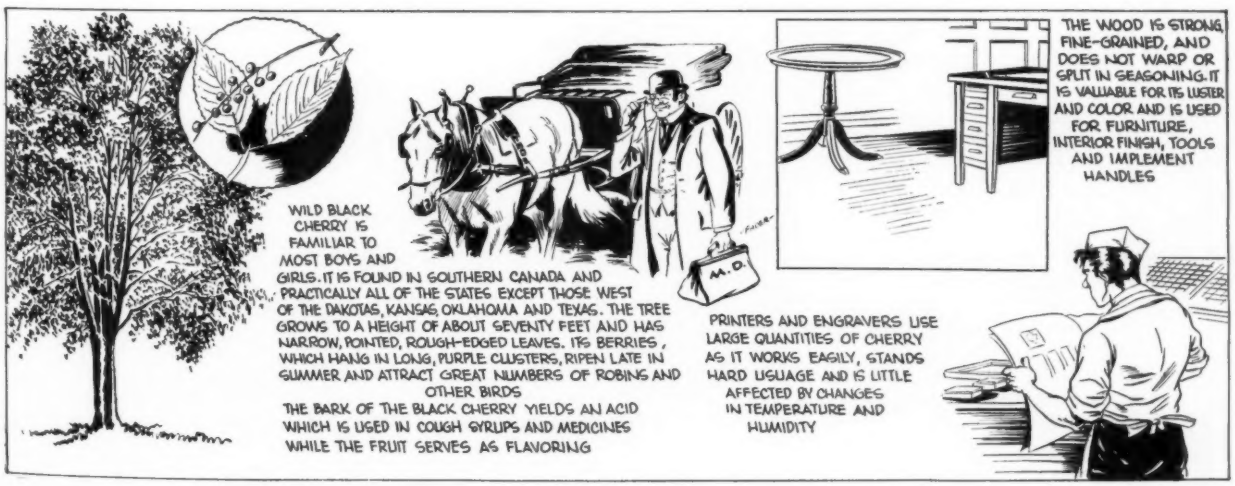
Submarine science has long been known to animals. Certain spiders are able to live under water, taking bubbles of air to the bottom with them. Nymphs of caddis flies normally live under water, and many beetles are able to survive for some time submerged. The octopus and squid are well known for their "smoke screens" under water, when trying to escape from their enemies. Some other animals, such as the familiar "pond-skaters" and the whirligig beetles, are able to walk on the surface of water without breaking the surface film. Others, like ants, can swim, using their six legs for rowing like a six-oared crew.

Druggists which peddle narcotics are found among the insects. In Java, there is a strange bug which secretes a strong narcotic. This bug allows ants to feed upon this secretion, and when the ants are overcome by the drug, the beetles devour them.

Man has learned many truths from animals. Some of these truths have been improved in the hands of man, while some others have never been utilized by him as efficiently as by the animals from which he learned them. We shall undoubtedly yet learn many more valuable lessons from these humble creatures living about us.

TREES AND THEIR USES

No. 12 - - - CHERRY


WILD BLACK CHERRY IS FAMILIAR TO MOST BOYS AND GIRLS. IT IS FOUND IN SOUTHERN CANADA AND PRACTICALLY ALL OF THE STATES EXCEPT THOSE WEST OF THE DAKOTAS, KANSAS, OKLAHOMA AND TEXAS. THE TREE GROWS TO A HEIGHT OF ABOUT SEVENTY FEET AND HAS NARROW, POINTED, ROUGH-EDGED LEAVES. ITS BERRIES, WHICH HANG IN LONG, PURPLE CLUSTERS, RIPEN LATE IN SUMMER AND ATTRACT GREAT NUMBERS OF ROBINS AND OTHER BIRDS
THE BARK OF THE BLACK CHERRY YIELDS AN ACID WHICH IS USED IN COUGH SYRUPS AND MEDICINES WHILE THE FRUIT SERVES AS FLAVORING
M.D.
THE WOOD IS STRONG, FINE-GRAINED, AND DOES NOT WARP OR SPLIT IN SEASONING. IT IS VALUABLE FOR ITS LUSTER AND COLOR AND IS USED FOR FURNITURE, INTERIOR FINISH, TOOLS AND IMPLEMENT HANDLES
PRINTERS AND ENGRAVERS USE LARGE QUANTITIES OF CHERRY AS IT WORKS EASILY, STANDS HARD USUAGE AND IS LITTLE AFFECTED BY CHANGES IN TEMPERATURE AND HUMIDITY

BLACK CHERRY

Prunus serotina Ehrhart

BLACK CHERRY grows in all the eastern states and Nova Scotia as far west as South Dakota, and south through the mountain ranges of western Texas, into southern New Mexico, Arizona, Mexico, Colombia, and Peru. Frequently reaching heights of sixty to eighty feet with trunk diameters at breast height of two or three feet, occasional forest trees are 100 feet high and four feet in diameter, with a clean, uniform trunk extending forty to sixty feet. In the open tortuous, more or less horizontal branches form a spreading oval crown. Best development is attained in the Southern Appalachians where extreme ages of 150 to 200 years are attained. It prefers deep, rich soil with uniform moisture, but thrives under many soil and moisture conditions.

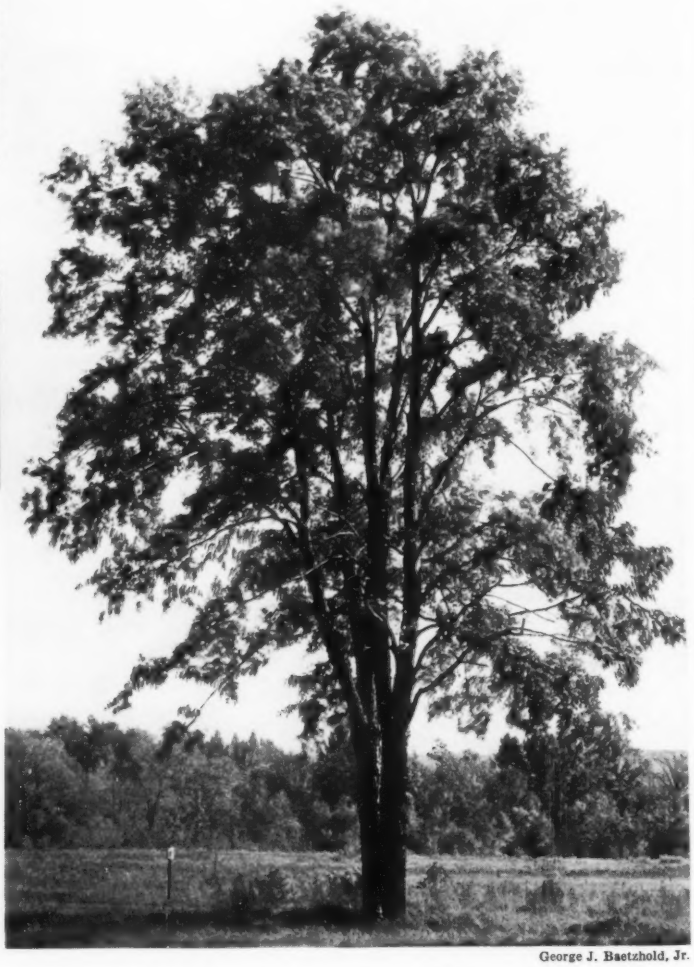
George J. Baetzhold, Jr.

Open grown cherry trees develop a spreading oval crown whose tortuous, more or less horizontal branches are clothed in summer with dark green foliage. Forest trees are frequently characterized by a long symmetrical trunk free of side branches.

The dark green, simple leaves are oval or pointedly lance shaped, with fine incurved teeth on the margin. They occur alternately on the twigs, are two to five inches long, one inch to one and a half inches wide, smooth on both sides, pale green below, with fine hairs near the light colored mid-rib and veins, and one or more red glands near the base. The slender leaf stem, or petiole, is one-half to three-quarters of an inch long.

In April or May, when the new leaves are still red, four to six inch drooping clusters of perfect, five-petaled white flowers appear. Domestic cherries produce blossoms before the leaves, so the Latin name *serotina*, meaning "appearing late," refers to the belated flowers, while *Prunus* is the classical name for all cherries and plums.

Drooping clusters of pea-sized cherries, so dark red as to be nearly black, with purple, juicy pulp develop by late summer. They have a pleasant, slightly bitter taste and are sometimes used in a beverage called



George J. Baetzhold, Jr.

"cherry bounce"—hence the name "Rum Cherry." Within each fruit is a thin walled, slightly egg-shaped pit about a third of an inch long, enclosing the seed. Trees bear seed at intervals of three or four years from early youth to old age. The fruit is eagerly eaten by birds who distribute the seeds over wide areas. The seedlings demand sunlight and grow best in the open.

The dark bark of old trees is broken into irregular, easily peeled, scaly plates and is about three-quarters of an inch thick. On young trees and branches it is satin smooth, dark red brown, with conspicuous horizontal, pale lenticels or breathing pores. When wounded a gum similar to gum arabic exudes from the bark. The twigs are slender, smooth, red brown, and like the leaves and inner bark contain prussic acid which gives an aromatic flavor resembling bitter almonds. This element may be responsible for its use in tonics and cough remedies. The same substance may cause severe illness or death to livestock which eat the wilted leaves.

The reddish-brown, close-grained wood is hard, relatively light, and when air dry weighs about thirty-six pounds to the cubic foot. The sapwood is yellow and thin. Cherry is extensively used by the printing trade to back electrotypes and zinc etchings. Its beauty, lustre, ability to withstand knocks, and ease of working encourages its use for furniture, interior trim, veneers, and tool handles. Like mahogany, the color deepens with age, and the wood ranks close to walnut for cabinet purposes.

The commercial stand is estimated to be 453,000,000 board feet and the annual lumber production is about 7,500,000 board feet, coming largely from West Virginia and Pennsylvania. Additional amounts are cut for fuel, fence posts, and railroad ties.

Cherry trees are susceptible to many insects and diseases. Tent caterpillars feed on the leaves and sometimes fatally denude the trees, while "black knot," a fungus disease of the twigs and branches, causes severe injury. Surface fires permit the entrance of wood rotting fungi, causing hollow butts.

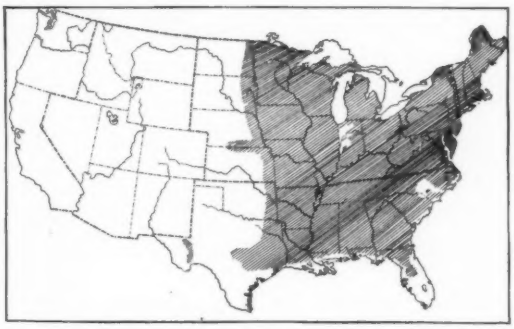
Cherry is not a satisfactory street tree, but it can be planted anywhere within its natural range for its showy blossoms, its fruit which attracts birds, and its unconventional form.

George J. Baetzhold, Jr.

Clusters of dark red cherries ripen in late summer and early fall.

Drooping racemes of white flowers, with the principal parts in fives, appear after the leaves.

The dark colored bark of mature trees consists of many irregular scaly plates and may be three-fourths of an inch thick.



Natural range of black cherry in the United States.

AROUND THE STATES
WITH
THE AMERICAN FORESTRY ASSOCIATION

President Roosevelt Calls National Wildlife Conference

A five day national conference on conservation of wildlife, in which the public is not only invited but urged to participate, has been called by President Roosevelt to meet in Washington February 3 to 7. About 1,000 delegates representing all the states and private organizations will attend the meeting, which, unprecedented in size and scope, is to be known as the North American Wildlife Conference. Canada and Mexico have been invited to participate.

From this conference, an open forum for public discussion, the President hopes for new cooperation between public and private agencies to remedy conditions threatening extinction of many forms of wildlife in the country.

Three major objectives constitute the fundamental purposes of the conference, it was announced. First, is the organization of a permanent national federation of all agencies, societies, individuals and clubs interested in the restoration and conservation of wildlife resources with the avowed purpose of securing adequate recognition of the needs of wildlife resources. Second, is the development of a national program for the advancement of wildlife restoration and conservation; and third, is the presentation of such facts, discoveries and information pertinent to wildlife as may contribute to the solution of mutual problems.

The federation plan as proposed calls for the organization in the counties of each state of interested groups into county federations. These will be unified into district federations which, in turn, will form state federations. The state federations will then become units of the general federation of wildlife interests.

President Roosevelt will address the conference, as will Secretaries Wallace, of the Department of Agriculture, Ickes of the Department of the Interior, and Roper of the Department of Commerce.

The five day program, as announced at the time of going to press, provides for morning and afternoon sessions, the morning sessions to be devoted to discussion of specific topics of basic importance to wildlife restoration and conservation, and the afternoon sessions to be general.

On Monday, February 3, the morning sessions, running concurrently, will deal with farmer-sportsman cooperation, fish management, and upland wildlife research. Discussion on each subject will be led by a chairman and a committee of three. The general afternoon meeting with F. A. Silcox, chief of the Forest Service, serving as chairman, will feature an address, "The Wildlife Crisis," by J. N. "Ding" Darling, famous conservationist and cartoonist who recently resigned as chief of the Biological Survey. Representatives of the governments of Canada and Mexico will present the wildlife situation in their respective countries.

The morning sessions on Tuesday, February 4, will be devoted to game breeding, forests and forest wildlife, and group initiative in fish rearing, the three discussions running concurrently. The general session will be divided into two parts, with Hoyes Lloyd, director of Wildlife, Canadian National Parks, serving as chairman. The first part will deal with the subject "Why Concern Ourselves About Wildlife?" The economic importance of this subject will be presented by Allen Whittfield, president of the Junior Chamber of Commerce; the social importance, by Mrs. Roberta C. Lawson, president of the General Federation of Women's Clubs; and the importance to youth by a member of the Boy Scouts of America. The second part will be opened by Secretary of Agriculture Wallace with a brief address. He will be followed by Dr. John C. Phillips, associate curator of birds, Museum of Comparative Zoology, Boston, whose subject will be "International Protection of Wildlife"; Frederic A. Delano, a member of the National Resources Committee, who will speak on "Wildlife in the National Resources Picture"; William L. Finley, famous wildlife conservationist of Portland, Oregon, whose subject will be "Wildlife, Past, Present and Future"; and Lithgow Osborne, Conservation Commissioner of New York, on the subject, "Organization, Cooperation and Harmony in Wildlife Management."

In the evening will be the Wildlife Banquet, at which President Roosevelt will speak. One of the features of the banquet will be the showing of wildlife motion pictures by Dr. Arthur A. Allen of Cornell University.

Wednesday, February 5, will be devoted to general business and organization of the wildlife federations.

On Thursday, February 6, the morning sessions will be resumed with discussion on wildlife disease and population cycles research, research in waterfowl problems, and pollution. The first part of the general session, with Edward A. O'Neal, president of the American Farm Bureau Federation serving as chairman, will offer solutions of the wildlife problem by education, with Secretary of the Interior Ickes opening the session with an address, "Conservation by Education." John W. Studebaker, commissioner of the Office of Education, Department of the Interior, will discuss conservation by education in the public schools; C. W. Warburton, director of Extension Service, Department of Agriculture, through the extension service; John H. Baker, executive director of the National Association of Audubon Societies, by conservation organizations; Carl Bickel, of the Scripps-Howard Newspaper organization, through the press; and Frank Mullen, chairman, National Radio Conservation Council, by radio.

Courtesy The American Magazine

Jay N. "Ding" Darling will have a prominent part in conference activities.

Aldo Leopold, in charge of Game Research, University of Wisconsin, and L. J. Taber, master of the National Grange, will speak on the solution of the wildlife problem by management.

The second part of the general session, with Henry Solon Graves, president of The American Forestry Association, serving as chairman, will be devoted to the solution of the wildlife problem by public agencies. Speakers scheduled to discuss this phase include F. A. Silcox, chief, United States Forest Service; George Wright, in charge of Wildlife, National Park Service; F. R. Carpenter, director, Division of Grazing, Department of the Interior; John Collier, commissioner, Bureau (*Continuing on page 84*)

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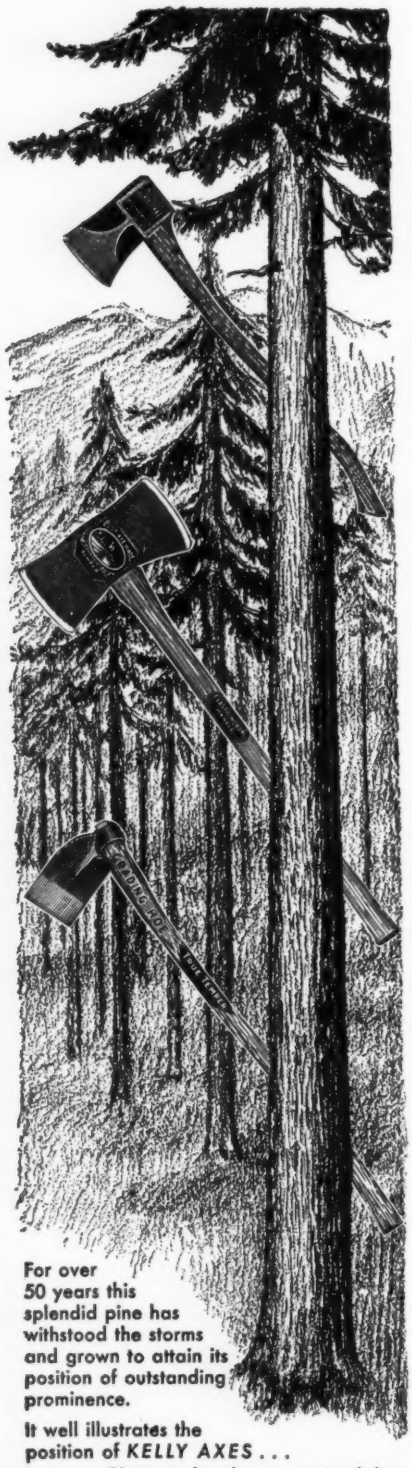

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SILCOX CLARIFIES POSITION ON FOREST ACQUISITION AND CREDIT BEFORE WESTERN GROUP

An integrated program of private and public forest holdings which will make for sustained yield operations, bring about the greatest possible degree of social security for communities and for the lumber industry, and provide foundations for long time forest investments at low rates of interest, were objectives stressed by F. A. Silcox, Chief, United States Forest Service, at the annual meeting of the Western Forestry and Conservation Association in Portland, Oregon, December 13, 14 and 15. Urging the lumber industry to clarify its social objectives by giving expression to a fundamental policy of balanced public and private ownership, the Chief Forester proposed that it work for legislation to make such ownership possible, and to modify the credit and taxation systems.

Representing the forestry industry, protective associations, and public agencies of the western pine, Douglas fir, and redwood regions, the meeting heard its president, G. F. Jewett, in his opening address declare: "The industry does not willingly seek to bargain with the government. It asks only that the government try to encourage what industry has that is good, and by precept and leadership remove the artificial barriers which make further progress so difficult. Without any spirit of defiance whatever, I assert that real progress can be made in no other way. I think with proper leadership we have the opportunity to organize our forests on a sustained yield basis. I think the chief obstacle to this at present is the attitude of the government. It has embarked upon programs which cast great doubt upon the wisdom of private forest investment."

In response, Mr. Silcox promised to back sound forest-loan legislation, saying: "There is definite public responsibility to make credit facilities available on reasonable terms to an industry such as the lumber industry. This is because there is a very real public interest vested in all forest lands, irrespective of ownership; because its size makes the lumber industry important from the standpoint of employment; because it is in the public interest to see that these timber properties are so handled that there may be continuity, through industry, for individuals and communities dependent on it. But I shall insist on provisions calling for management of these areas on a long time rather than a quick liquidation basis; for sustained yield forest management, in other words. I think the public is fully justified in using its collective credit on that basis, and that the Joint Conference growing out of Article X was wise in making a proposal of that sort.

"Incidentally, why does the lumber industry back off from any mention of sustained yield—which involves long time management —when it asks for long time loans? In all fairness, why shouldn't the latter be predicated upon the former?"

Then, referring to the frequently expressed fears that he favors logging and milling operations by the government, Mr. Silcox said: "My personal belief is that the government should not take over any administrative functions that private industry may carry on, provided that private industry recognizes and fulfills, as a part of its enterprises, its social regulations."

His earlier statement to the effect that if necessary the government would go into logging and milling was described by him as a danger signal—"a note of warning that the lumber industry must, for its own protection, recognize the fundamental necessity for fixing certain social responsibilities which are entirely aside from the creation of wealth and the bookkeeping aspects of its business problem. In my opinion the time has come when, if the survival of a forest-industry community is at stake, this issue will be settled by the community, not by the Forest Service, or by the lumber industry."

Similarly, answering the fears that the government is headed toward public ownership of all forest properties, he assured the meeting that it considers integration of public and private forest industry wiser.

The possibility of complete public ownership of forest properties had been characterized by President Jewett as "extreme left" or "socialism." Then with reference to Federal purchases of cut-over land approved and contemplated in Louisiana, the Forester said: "If it is socialism to take over 2,000,000 acres of Louisiana forest lands which were paying no taxes, growing no trees—if it is socialism for Uncle Sam to extract enough money from the national pocketbook, which is your pocketbook and mine, to take care of those people —then let it be called that. No matter what it is called, and even if to do it we must have public ownership of the entire 2,000,000 acres, I believe we should put that land to some good use. I would much prefer to see private owners take over such acreages as that in Louisiana, establish nurseries, and go in and plant. But I have not seen them doing so. Probably the only agency to do this is the Federal Government."

The Forester characterized the whole system of forest taxation in the United States as fundamentally unsound. Referring to the results of the ten years' study recently reported by the Forest Taxation Inquiry, he said: "There should be a fundamental readjustment of taxation on timberland, but in view of the doctrine of state sovereignty, the Federal Government has some hesitancy in urging, too strongly, the states and the counties to revise their system of taxation in order to make a deferred yield plan effective."

David T. Mason, resigning manager of the Western Pine Association, declared that in his judgment the public needs a suitable rather than a maximum degree of forestry practice applied under the principles of the American system at a minimum cost. He pointed out the obstacles which thus far have prevented the application of forestry to forest lands—unsound taxation, insufficient protection, the lack of suitable credit system, the lack of technical knowledge, too much threatening and not enough cooperation from public officers, and finally, an over burden of timber in private hands in some places.

Public acquisition, said Mr. Mason, may contribute most effectively if solid areas are bought for publicly-owned sustained yield units rather than by confining the purchases to denuded lands at minimum prices. Purchases, he said, should be primarily in regions where the ownership problem is most acute, where greatest pressure for premature liquidation exists and where such liquidation hinders progress over broad areas. Mr. Mason recommended an acquisition policy which would approach the problem unit by unit, seeking to work out mutual undertakings to the end that private owners and operators will carry as much of the timber as practicable, with the public acquiring the remainder for future operations. One condition of public acquisition, he explained, should be an agreement among the adjoining timberland owners to operate on a sustained yield basis.

Colonel W. B. Greeley, secretary-manager of the West Coast Lumbermen's Association, discussed the need for cooperation between the public and industry in a forest conservation program.

Ickes Gets Shenandoah Park Deeds

Secretary of the Interior Harold L. Ickes, on December 27, accepted deeds conveying 176,429.80 acres of land in Virginia for the establishment of the Shenandoah National Park. Acceptance of these deeds has been held up by litigation testing the State's right to condemn property for Federal park purposes—a Supreme Court decision upholding the State.

The deeds accepted had been signed on behalf of the State of Virginia by Governor Peery and by William E. Carson, former chairman of the Commission on Conservation and Development.

The park originally was authorized on May 22, 1926, to constitute a minimum area of 385,000 acres. Later surveys by the National Park Service resulted in the considerable reduction of the area and Congress, by Act of February 4, 1932, reduced this to a minimum of 160,000 acres.

American Foresters Elect Officers

H. H. Chapman, professor of Forestry at the Yale Forest School, has been re-elected president of the Society of American Foresters, it has been announced. S. T. Dana, dean of the School of Forestry and Conservation, University of Michigan, was elected vice president.

At the same time it was announced that the annual meeting of the Society will be held at Atlanta, Georgia, January 27 to 29.

Council Members elected by the foresters were F. W. Besley, of Maryland; Emanuel Fritz, of California; Ward Shepard, of Washington, D. C.; S. N. Spring, of New York; G. H. Collingwood, of Washington, D. C.; Verne Rhoades, of North Carolina; E. I. Kotok, of California; R. H. Rutledge, of Utah; and Hugo Winkenwerder, of the State of Washington.

Draft Forest Conservation Bill

An "Omnibus" bill to provide for an enlarged Federal participation in a coordinated national plan for American forestry, including aid to states and private owners, promotion of sustained yield forest management, forest research, and the acquisition and management of National Forests as foreshadowed in the Copeland Report of March 27, 1933, and again in the report of the National Resources Board of November 28, 1934, has been drafted by members of the Forest Service. No plans for its introduction in Congress have been announced, however.

The proposed bill has been described as the most comprehensive and all-inclusive single piece of forestry and conservation legislation yet considered, for it would practically rewrite the Clarke-McNary Act of 1924, materially amplify the McSweeney-McNary Act of 1928, amend other basic laws, and give legal sanction to at least five new activities of the Forest Service.

Included within its twenty-four sections is a material expansion of the cooperative program of forest fire protection, an accelerated schedule of forest purchases, broader fields of forest extension, legal authority for continuing the Great Plains Shelterbelt and expansion of forest planting.

Although the authorizations may never be equalled by actual appropriations, it is significant that ten sections authorize possible annual appropriations aggregating more than $80,000,000. A $500,000,000 bond issue for forest purchases is suggested, and eight sections limit the authorization for appropriations with the consent of Congress "to such sums which may be necessary in carrying out the projects of this Section."

(*Above*) Cross section showing accordion fold wires around detonator. (*Right*) Photograph showing how wires give end protection to detonator.

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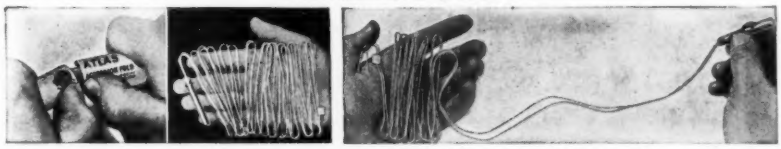

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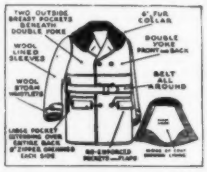

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1935 INDEX

The 1935 Index for AMERICAN FORESTS Magazine will be available February 15, to all who request it.

Requests which we have on hand at the present time will be filled immediately upon publication of the Index.

THE AMERICAN FORESTRY ASSOCIATION

1713 K Street, N. W.
Washington, D. C.

ASSOCIATION PURCHASES PERMANENT HOME

Acquires Property on Farragut Square in Nation's Capital

AFTER sixty years of continuous service in behalf of the country's forest resources, The American Forestry Association, on December 28, acquired a permanent home in Washington, D. C.—a four story, eighteen-room building at 919 Seventeenth Street, Northwest, facing Farragut Square, and within two blocks of the White House. The Association will take possession June 1.

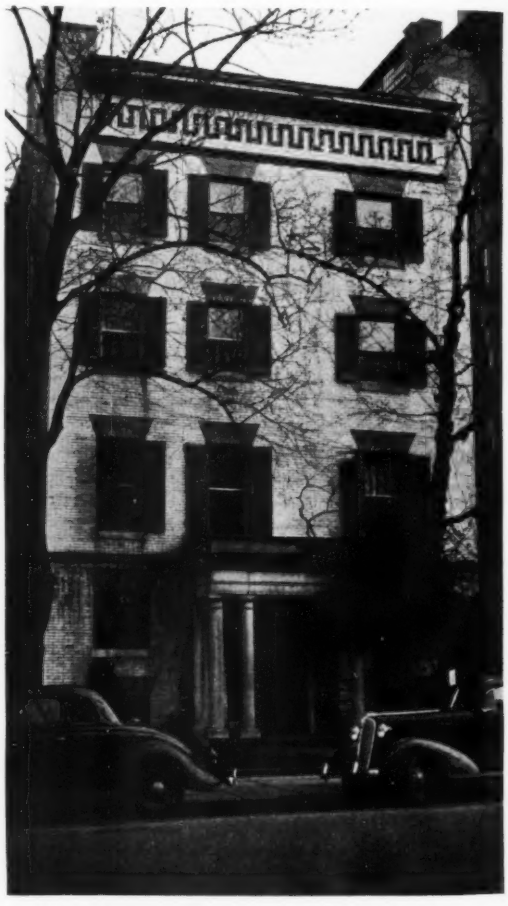
In acquiring a permanent headquarters, the Association brought to a conclusion a movement which began twenty-one years ago. Original discussions for a permanent home date back to a meeting of the Executive Committee of the Association on January 13, 1914, when a committee was appointed "to consider the advisability of securing an option on a site in Washington, D. C." At a meeting of the committee in New York on February 11, its members reported "progress." No action was taken, however, and on December 2, 1919, the Board of Directors appointed the Association's president, chairman of its Finance Committee and its executive secretary to "inquire and report upon the advisability and cost of securing a permanent home in Washington." On February 4, 1920, more definite action was taken, when the Board of Directors appointed a committee to "purchase if deemed advisable the building at 1742 M Street, Northwest, Washington, D. C." This purchase did not materialize and the Association continued to rent space for its headquarters.

Then, at a meeting of the Board of Directors on May 1, 1929, a proposal to make the raising of money for the acquirement of a permanent home a definite project of the Association was approved. On October 11, $15,000 of the Association's funds were set aside as the nucleus of a building fund by action of the Board.

No definite step in the purchase of a building was taken, however, until 1934 when the Board of Directors, on December 7, authorized and directed a committee to 'investigate the advisability of purchasing the present (1713 K Street, Northwest, present headquarters of the Association) or some other building as an Association headquarters." The building occupied by the Association at the time was rejected by the committee, and after investigating numerous other buildings in the city, the property at 919 Seventeenth Street, owned by the Cathedral Foundation, in Washington, was approved.

The building, originally owned by Gertrude Waldron Myer, is an English basement type with four floors suitable for office purposes. Known as Lot 804 in Square 185, the property comprises a total of 3,867 square feet, which with the building has an assessed valuation of $49,803. The building contains approximately 83,000 cubic feet.

The Board of Directors approved the purchase of this building at a cost "not exceeding $50,000" on either of the following terms: First, all cash; second, part cash and the balance of the purchase price by notes at a rate of interest not exceeding five per cent. The Finance Committee determined that in view of the low rate obtainable on securities held by the Association in the present market it would be profitable to pay cash for the property. Accordingly, an agreed purchase price of $49,250 was negotiated, and on December 28, the building became the property of The American Forestry Association for its permanent home and headquarters.



New Permanent Headquarters of The American Forestry Association at 919 Seventeenth Street, Northwest, Washington, D. C.

On January 13, the Board of Directors, meeting in Washington, authorized the expenditure of not to exceed $3,500 for such improvements as are necessary.

Adjoining the Army and Navy Club of Washington, the Association's new home is admirably located. It is across Farragut Square from Connecticut Avenue and centrally located with respect to down town Washington. And within a block is Lafayette Park, containing ninety-two different kinds of trees and shrubs, a greater variety than any other park in Washington.

National Parks Have Best Year

Americans are making greater use of their National Parks than ever before, according to the annual report of the National Park Service. During the fiscal year, 1934-1935, visitors to the parks, 6,337,206 in number, including National Monuments, increased twenty-two per cent over the preceding year, which up to that time had been the banner year of National Park history.

Changes in the status of park and monument lands during the year were mainly in the direction of new acreage for existing members of the system. No new parks were created and but one National Monument. Thus there are now twenty-four National Parks, one National Historical Park, sixty-eight National Monuments, eleven National Military Parks, ten Battlefield Sites, eleven National Cemeteries, and four miscellaneous memorials, comprising a total of 15,249,333 acres.

Recommendations made in the report include the enlargement of Crater Lake National Park, in Oregon, additions to the Grand Canyon National Park, in Arizona, and the General Grant National Park, in California. The report emphatically recommended the addition of land to the Grand Teton National Park, in Wyoming, including Jackson Hole, for "protection of the country's largest elk herd and completion of the park as a scenic area". Establishment of Kings Canyon National Park, in California, was strongly urged.

It was recommended that, "due to the steady timber activities nearby", the Mount Olympus National Monument, in Washington, be extended to include a representative sample of the forested lands in the Olympic National Forest.

Darling Sees Wildlife Advance

Allotments from emergency funds during 1935 provided "the most noteworthy contribution the Federal Government has ever made to wildlife," declared J. N. "Ding" Darling in his annual report as chief of the Biological Survey, which he submitted to the Secretary of Agriculture before he resigned. Practically all of a $1,000,000 fund for acquiring refuge land was obligated, as was a fund of $2,000,000 for rehabilitation of new and old refuge areas. Nearly all of the fund of $5,000,000 ear-marked by the Federal Emergency Relief Administration for the purchase of migratory waterfowl refuge areas was also obligated, he said.

Restoration activities, according to the report, went forward on nineteen major refuges and thirteen secondary areas and nesting grounds. With ninety-nine refuges previously established, the number of refuges supervised by the Survey or in the process of establishment on June 30 was 137.

Wildfowl conservation through reductions in the annual kill by hunters has also been stressed as part of the wildlife restoration program, Mr. Darling reported. Studies conducted, he pointed out, led last fall to the "most rigid restrictions in the history of American wildfowling".

Research work during the year included an intensified investigation of waterfowl conditions, studies of elk, mountain sheep and of caribou in Minnesota; and research in forest wildlife relationships. Mr. Darling reported that 249,829 birds were banded by the Bureau's cooperators during the year. He also reported that the numbers of injurious rodents were reduced on 11,000,000 acres for the protection of farm crops, range grasses, silvicultural plantings, reclamation waterways, and surface soils threatened by erosion.

The Wichita National Forest and Game Preserve in Oklahoma was transferred to the Biological Survey during the year for administration as a wildlife refuge and research station, for the maintenance and study of buffalo, elk, deer, Texas longhorns, and other wildlife.

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Wallace Sees Forest Lands Vital in Fight for Recovery

Forestry in relation to agriculture, wildlife as a factor in the land use program, and the desirability of linking soil conservation with the long time agricultural planning now under way are discussed by Secretary Henry A. Wallace in his annual report to the President.

"Forest lands offer a striking example of the American record of land misuse," declared the Secretary. "These lands constitute almost one-third of the area of continental United States." On the lands which are in private ownership, the Secretary pointed out that fires have burned more than 41,000,000 acres annually, while the ax and fire together have devastated or crippled close to 74,000,000 acres.

"Now, after 150 years of mismanagement, we are attempting to put our forest lands in order. In this tremendous task, people are reemployed; hope replaces despair. Through emergency forest work, forest lands become a vital factor in the fight for recovery."

Special emphasis was given wildlife as a crop by Secretary Wallace. He said: "Flood control and the prevention of soil erosion may, indeed, depend greatly on the conditions that also favor wildlife and wilderness areas. The return to wildlife of land now in agriculture may seem to involve a sacrifice of human interests; but, on the contrary, the economic advantages of protecting fur bearers, game animals, and birds, and simultaneously of conserving water, soil, and forest resources may be very great."

Outlining the necessity for a constructive, national program for the conservation of soil, the Secretary said: "In long time agricultural planning, the policies which increase current farm incomes should be linked with efforts to protect the physical body of the soil. ***Not until the frontier had dissolved into the Pacific did we realize that the opportunity to abandon worn out land for new was gone. Up to that time we had been imbued with a pioneer psychology that was indifferent to the soil lessons of history and to contemporary practice in other countries. A physical crisis in agriculture, coming on top of an economic crisis, shook us out of this lethargy, warned us dramatically that our ratio of population to productive land resources is going up, that practically all the better lands have been occupied for agriculture, that much formerly fertile land has been ruined or greatly impoverished, and that considerably more land will go the same way unless we take steps to save it."

Soil Conservation Service Reports Wide Activity

Approximately 250,000 persons, representing at least 12,500,000 acres of cultivated land, inspected erosion-control work in the forty-seven demonstration areas of the Soil Conservation Service during the past year, H. H. Bennett, chief of the Service, estimated in his annual report.

In addition to these visitors from outside the demonstration areas, soil conservation practices were demonstrated directly to approximately 12,000 landowners who voluntarily signed cooperative agreements with the Service to utilize more than 1,600,000 acres of their land for a five-year period as erosion control demonstration areas.

In the field of surveys, the most important work of the year was the completion of a Nation-wide reconnaissance erosion survey. The survey covered every county in the country and included not only the character and distribution of soil erosion, but the degree of slope, prevailing type of soil and present use of the land.

"Evidence of accelerated or man-induced erosion in one form or another was found either of frequent occurrence or as a prevailing characteristic within an area comprising 832,083,436 acres," Mr. Bennett stated. "Not all this erosion was serious, and many areas were not eroded at all, although falling within the general category of eroding land. For instance, 48,959,596 acres were found, over which, generally, there were scattering gullies but no extended, serious sheet erosion. Serious erosion was found to be much more wide-spread than had been expected, however. The survey revealed that the greater part of an area of 44,213,887 acres outside of the arid western region had been essentially destroyed by wind or water erosion.

NATIONAL WILDLIFE CONFERENCE

(*Continued from page* 78)

of Indian Affairs, Department of the Interior; Elliott Barker, Chief Game Warden of New Mexico, and president of the International Association of Game, Fish and Conservation Commissioners; Hunter Kimball, director of Conservation of Mississippi; N. B. Cook, Secretary of the Fish and Game Commission of Utah; Rudolph Bennett, director of the Missouri Wildlife Survey; Arthur L. Clarke, superintendent of the Connecticut State Board of Fisheries and Game; and others.

On Friday, February 7, the morning session will be devoted to discussion of practical game management, fur resources management, and stream and lake improvement, the sessions running concurrently.

The general session, with Elliott Barker serving as chairman, will again deal with the problem of solution, with an opening address by Secretary of Commerce Roper. Other speakers on the program are Ernest G. Holt, of the Soil Conservation Service; W. C. Henderson, of the Biological Survey, P. S. Lovejoy, of Michigan, whose subject will be "Harmonizing Conflicting Interests in Land Management." Ira N. Gabrielson, new chief of the Biological Survey, will conclude the session with a presentation of "The National Program for Wildlife Restoration." Representatives of the governments of Canada and Mexico will join Mr. Gabrielson in presenting the programs of their respective governments.

F. A. Silcox, chief of the Forest Service, was appointed chairman of the conference by President Roosevelt.

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QUESTION: What can I plant to control erosion on my waterfront property on Chesapeake Bay?—R. B. D., Maryland.

ANSWER: Beach plum (*Prunus maritima*) grows satisfactorily down to the water's edge and controls erosion except under severe battering of high waves. The same is true of Scotch broom (*Cytisus scoparius*), which proves successful on the higher slopes, while on similar land Black locust (*Robinia pseudocacia*) can be planted for permanent cover.

QUESTION: Every year, about August, the leaves of our basswood trees are covered with a sticky substance which turns black, and everything that grows under them such as plants, shrubs, and grass is covered with this black disease. Can you tell me the reason for it? And is there any spray we could use? —M. H, Massachusetts.

ANSWER: The sticky substance is probably the result of a plant louse, or aphid. By looking on the surface of the leaves when the sticky substance is most apparent, tiny, green insects sucking the sap from the leaf and exuding a sticky fluid may be seen. These insects seldom kill a tree, but they do retard its growth. The blackened appearance is due to a sooty fungus which develops in the sweet secretion. The insects can be controlled when they first appear if the entire tree is sprayed with a solution consisting of nicotine-sulphate and soapy water. Nicotine-sulphate can be purchased in any drug store or feed store as "Black Leaf 40." It should be mixed at the rate of three-fourths of a pint to one hundred gallons of water together with six or eight pounds of cheap soap which serves to spread the poison and hold it on the leaves.

QUESTION: A number of years ago, a United States Army plane scattered tree seeds over an eroded area in Hawaii. What was the result of that effort?—L. J. D., Illinois.

ANSWER: On November 15, 1929, Assistant Forester A. W. Duvel, using a United States Army monoplane, scattered a total of 1,689 pounds of seed of various species of forest trees over the forest reserves in the western part of the Island of Kauai. A considerable amount of seed of the New Zealand Karaka tree (*Corynocarpus laevigata*) was thrown over the Alakai Swamp which is a huge wilderness near the center of the Island.

Recently while making a reconnaissance for new trails to be constructed through this swamp some of the Civilian Conservation Corps boys discovered 400 Karaka trees ranging from five to eight feet in height and growing in a narrow strip through a portion of this swamp. These trees are undoubtedly the results of the seed sown from the air six years previously.

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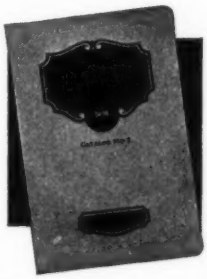

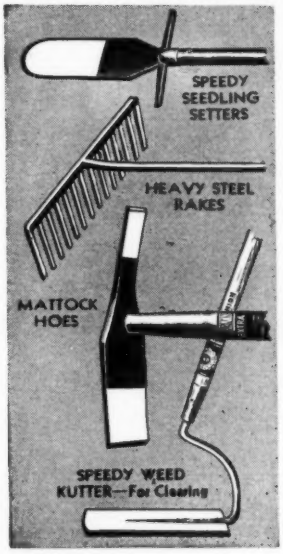

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Book Reviews

OUR AMERICAN MAPLES AND SOME OTHERS, by Margaret Curtin Finley. Published by The Georgian Press, New York. 79 pages. Price $3.00.

Unusually attractive and informative photographs of identifying features of fourteen varieties of maples make up the bulk of this attractive book. Individual photographs reproduced in clear half-tones portray the tree forms in summer and winter. These are accompanied by full page illustrations of leaves, blossoms, fruits and bark of characteristic American trees such as sugar maple, red maple, Oregon maple, together with the widely adopted exotic members of the family known as Norway maple, sycamore maple and Japanese maple.

The descriptions are accurate and the book is so attractive that it should meet a widespread public need.—G. H. C.

PRACTICAL EVERYDAY CHEMISTRY, by H. Bennett. Published by The Chemical Publishing Company of New York. 305 pages. Price $2.00.

A brilliant chemist has said of this book that it tells how to make everything except love and little green apples, and we will not take issue with him. If you are eager to acquire a knowledge of practical chemistry and to have revealed to you some of the mysteries which long have lain hidden behind chemistry's magic veil, here you will find in compact form all you have sought. By following the simplest and clearest of formulas you may transform ordinary ingredients into hundreds of useful things such as cosmetics, inks, drugs, lubricants, polishes, beverages, lacquers, and one might go on with this list indefinitely. Full of interest and fascination, it is more, for it is an authoritative and standard work and the first modern work of its kind to be made available to the public. If you have yearned to dabble with chemicals, here is your opportunity safely to do so—follow the formulas in *Practical Everyday Chemistry.*—L. M. C.

SWEDISH-ENGLISH VOCABULARY FOR FORESTERS, by J. L. Deen, Assistant Professor of Silviculture, Pennsylvania State College, and A. B. Benson, Professor of German and Scandinavian, Yale University, in cooperation with M. J. Dannfelt, Swedish State Forester. Yale University School of Forestry Bulletin No. 40, price $1.00.

American foresters interested in the progress of Swedish forestry and forest research will welcome this new Yale Bulletin as an invaluable aid in translating technical Swedish forestry terms into the proper English equivalents. In this 83 page vocabulary the authors have covered some 4700 terms used in standard Swedish forestry publications. The aim was to supply to foresters a much needed supplement to the usual Swedish-English dictionary and they have wisely concentrated on terms, difficult to correct translation, seldom adequately handled in such dictionaries. The vocabulary will be invaluable to foresters studying Swedish, and for those having a fairly complete knowledge of the languages, will reduce to a minimum the necessity of referring to a dictionary.—R. F. T.

"FIRE LANES" IN WISCONSIN

Following publication in the January issue of AMERICAN FORESTS of "Truck Trails in the Adirondacks?" by Lithgow Osborne, Conservation Commissioner of New York State, presenting the policy of the New York State Conservation Commission in building truck trails into remote sections of the Adirondack Forest Preserve for fire control purposes, and comments on this policy by Robert Marshall, leader of numerous groups, aggressively opposing it, many interesting letters have been received by the Editor. One of these, from E. M. Dahlberg, of Ladysmith, Wisconsin, a former State Conservation Commissioner, is worthy of publication, and is herewith presented:

"As a Conservation Commissioner in 1931 I assisted in the authorization of several of these 'truck trail'—popularly called fire lanes in Wisconsin—projects. I always took the position, however, that we were dealing with a matter that was loaded with anti-conservation possibilities. Before I left the Commission in 1932, I had the reputation of being an objector on practically all proposed fire lane projects. Since 1931 literally thousands of miles of fire lanes have been projected into Federal, State and county forest areas, and across millions of acres of county owned and private lands. I have concluded that the position one takes on fire lanes in the wilderness is largely a matter of vision of the whole conservation pattern.

"If fire suppression is to be the only consideration, it must be conceded that these fire lanes are valuable. . . . But the probability of a fire starting in such an isolated situation is very remote. On the other hand, berry pickers, campers, hunters and side road tourists are constantly starting fires along these lanes. It certainly cannot be denied that the number of fires found in these areas increases in a fairly direct proportion with the number of miles of fire lane available. Fire prevention in the wilderness just seems to be a question of keeping people out. It is reasonable to suppose that this can be done far more effectively without the roads than with them.

"In the Lake States there are two major objections to fire lanes that Mr. Marshall did not stress. These are: The increase in the destruction of game, both lawfully and unlawfully, by fire lanes; and the encouragement of settlement of worthless lands and promotion of water frontage developmetns along the lanes. The destruction of game due to fire lanes is an evil which every game warden is thoroughly familiar with. For example we now have a fire lane along the Flambeau River which exposed to the public one of the last great natural refuges of deer and other large mammals. Shortly after the completion of this lane an open season on deer was declared. The gates across this lane were promptly demolished and an army of deer hunters took possession over night. Needless to say the slaughter of deer was too unspeakable to describe. And these were licensed hunters! From the standpoint of game conservation, fire lanes are the most serious menace that enforcement officers have had to contend with in recent years. . . .

"In the scramble of counties and communities to get as much of the public expenditure as possible, much of the fire lane construction in the Lake States became purely a matter of small politics. Large land owners and county officials pulled strings to get roads into areas where they had lands to sell. County zoning programs have been retarded or rejected because of the influence of men who wished to keep these lands available for prospective settlers. Many of the so-called fire lanes in Wisconsin are just new county and township roads and local sentiment will not tolerate closing them to the public.

"Wherever lake or river frontage is approached by these roads there is a lively traffic in summer cottage sites. . . .

"Most men are a little modest to admit any personal sentiment about the wilderness, but I think that Mr. Marshall touched on an exceedingly important matter when he said: 'The wilderness . . . has a value unique to outdoor recreation. It has a value which to countless individuals exceeds any other value there is.'

"I am one of those individuals. The fire lane I have already mentioned, running along the Flambeau River for a distance of twenty miles, has robbed the Flambeau of its rarest charm, its alluring wilderness atmosphere. Hundreds of lovers of outdoor adventure have come from far and near to take the famous canoe trip from Park Falls to Ladysmith. In 1927 there was no road between the OxBo and Big Falls, a river distance of thirty miles, with a score of thrills to satisfy the hardiest canoe enthusiast. At that time there were a few camps where canoe parties could put up in stormy weather, but they were about a good day's journey apart and would never be seen by parties without an experienced guide. . . . In 1934 dust from the fire lanes could be seen on both sides the river. Two C.C.C. camps of several hundred men each were busy 'conserving' the Flambeau Wilderness. . . . The rough overnight camps were gone, but in their place were scores of beautiful summer homes. . . .

"Sad stories like this 'conserving' of the Flambeau could be told about a thousand other rare bits of wilderness in the northern States that have been treated in the same way since 1931. Certainly the view one takes on 'fire lanes' or 'truck trails' depends on his vision of the whole conservation pattern. The conservation task involves something more than just putting out fire. If a policy that appears to be desirable in fire suppression proves to be a menace to fire prevention and game conservation, and despoils the rare bits of America's vanishing wilderness, then we believe that such a policy should be discarded."

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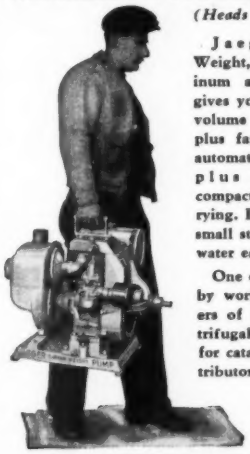

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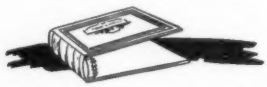

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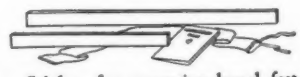

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1713 K STREET, N. W. WASHINGTON, D. C.

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Adequate Forest Fire Protection by federal, state and other agencies.

Reforestation of Denuded Lands valuable for timber, wildlife, protection of streams.

Protection of Fish and Game and other forms of wildlife under sound game laws.

Prevention of Soil Erosion

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Development of Forestry Practices by the forest industries.

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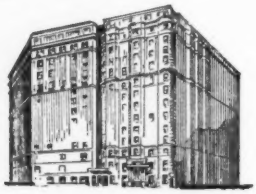

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C.C.C. WORK VALUED AT $579,000,000

Robert Fechner, director of Emergency Conservation Work, on January 10, said the value of the conservation work completed by the Civilian Conservation Corps during the first thirty months of operation has been estimated at $579,000,000. This estimate represents the present value of the thousands of miles of truck trails which the C.C.C. has built, telephone lines constructed, forest areas protected and improved, trees planted, park areas developed, soil erosion dams built, flood control operations, and all the other work projects completed through September 30. The Office of the Chief of Finance, United States Army, estimates the total obligations of Emergency Conservation Work through September 30, at $1,006,500,000.

Mr. Fechner stated that he had been advised by the technical services which supervise the work programs that preliminary reports indicate that during the calendar year just closed greater progress was made in saving and developing the nation's natural resources than in any previous year in the country's history. "Nationwide interest has been stimulated as never before in the conservation of our forests, in the conservation of wildlife and game, in the planting of trees, in the great need for saving agricultural lands from erosion and in the expansion and development of publicly owned lands of all kinds to afford recreational opportunities for the tens of millions of people who annually visit our forests and parks," he said.

Among the principal items of work completed up to September 30, upon which the valuation was based, are the following: 405,402,500 forest trees planted over denuded areas; 62,593 miles of new service roads and truck trails constructed through timbered areas principally for fire protection (of this amount nearly 60,000 miles were truck trails) and 30,121 miles of new telephone lines built into the nation's forest and park fire detection systems. Service roads and truck trails were maintained over 155,000 miles; telephone lines were maintained over 75,000 miles; over 1,223,000 man-days were devoted to fire presuppression and more than 2,244,000 man-days spent in fighting forest fires. A total of 44,040 miles of fire breaks were opened up through forested areas; fire hazards reduced over 1,274,201 acres; 2,428 lookout houses and lookout towers constructed in forests and parks for fire detection; forest stand improvement work completed over 2,094,000 acres; a total of 16,250 acres covered in campaigns to control rodent destruction; a total of 5,035,158 acres covered in campaigns to reduce losses caused by beetles, moths and other insects; tree and plant disease control work conducted over 4,815,684 acres; 1,635,000 check dams built in gullies to control soil erosion; completion of timber estimating over 25,239,731 acres and construction of 26,521 vehicle bridges.

Mr. Fechner stated that the C.C.C. had supplied work for varying periods of time to an aggregate of more than 1,500,000 persons. This includes enrolled men, army officers, supervisors, technical personnel, and educators.

NEW OFFICERS

Following the report of the Elections Committee, the new officers of The American Forestry Association for 1936 will be found listed below.

The American Forestry Association

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Washington, D. C.

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Trustee, Oglebay Institute

EDWARD A. O'NEAL, 3d—Illinois
President, American Farm Bureau Federation

LITHGOW OSBORNE—New York
Conservation Commissioner of New York

GEORGE W. PEAVY—Oregon
President, Oregon State College

ELMER GEORGE PETERSON—Utah
President, Utah Agricultural College

MISS CLAUDIA PHELPS—South Carolina
Chairman, Conservation of Natural Resources, South Carolina Federation of Women's Clubs

MRS. GEORGE D. PRATT—New York

MRS. ANNA B. SCHERER—Connecticut

DANIEL A. WALLACE—Minnesota
Editor, "The Farmer"

HENRY BALDWIN WARD—District of Columbia
Secretary, The American Association for the Advancement of Science

T. G. WOOLFORD—Georgia
President, Georgia Forestry Association

MRS. ROBERT C. WRIGHT—Pennsylvania
Chairman, Conservation and Roadsides, The Garden Club of America

Board of Directors

PHILIP W. AYRES, 1939—New Hampshire
Former Forester, Society for the Protection of New Hampshire Forests

F. W. BESLEY, 1940—Maryland
State Forester of Maryland

W. R. BROWN, 1939—New Hampshire
Chairman, New Hampshire Forestry Commission

P. R. CAMP, 1940—Virginia
Vice President, Camp Manufacturing Company

SAMUEL T. DANA, 1937—Michigan
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WILLIAM B. GREELEY, 1938—Washington
West Coast Lumbermen's Associatiton

W. B. GREELEY, 1936—New York
Camp Fire Club of America

A. S. HOUGHTON, 1939—New York
New York State Reforestation Commission

THOMAS P. LITTLEPAGE, 1938—District of Columbia
Past President, District of Columbia Chamber of Commerce

WILLIAM S. B. McCALEB, 1936—Pennsylvania
Pennsylvania Railroad

JAMES G. K. McCLURE, JR., 1937—North Carolina
President, Farmers Federation

JOHN C. MERRIAM, 1936—Dist. of Columbia
President, Carnegie Institution of Washington

WILLOUGHBY G. WALLING, 1938—Illinois

JOHN W. WATZEK, JR., 1940—Illinois
President, National Lumber Manufacturers Association

WILLIAM P. WHARTON, 1937—Massachusetts
National Association of Audubon Societies

FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

Except for the announcement of January 16, that the broad terms of the Soil Conservation Act of April 27, 1935, would be used as a basis for solving the farm problem incurred when the Supreme Court declared portions of the Agricultural Adjustment Act unconstitutional, no matters of major importance to forestry or conservation have been introduced or acted upon. The extent to which the program of the Soil Conservation Service may be enlarged to increase its field of influence holds the stage of chief conservation interest.

The recommendations of the Bureau of the Budget, as announced by President Roosevelt on the Monday following the opening of the second session of the 74th Congress on January 3, carried proposals which would increase the current year's appropriations for the Forest Service by nearly $5,700,000. This would bring the current appropriation of $11,600,000 to over $17,000,000. These increases are spread through the entire Forest Service structure, with a little more than $1,000,000 recommended for addition to the item for preventing fire and preparing against fire on the National Forests, $1,000,000 for work connected with the Great Plains Shelterbelt, and nearly the same amount to maintain existing improvements on National Forests.

Forest fire cooperation as authorized under the Clarke-McNary Act is recommended in the Budget to be increased by $152,750, bringing the total appropriation from $1,578,632 as now available to $1,731,382. State foresters and timberland owners cooperating under this section of the Clarke-McNary Act are prepared to urge Congress to increase this appropriation to equal the total authorization of $2,500,000. Whether this and other essential increases can be supported by the Federal bureaus concerned is uncertain in view of the recently announced rule of the Bureau of the Budget prohibiting all representatives of government departments from exerting influence regarding new appropriations or legislation until the proposal has cleared through the Bureau of the Budget or the National Emergency Council and received final approval by the President. Under the accepted interpretation of this rule, representatives of the public may urge increases to specific items before the Appropriations Committees, or may cause bills including specific appropriations to be introduced in Congress and referred to the respective committees, but neither reports from the cabinet officer or public hearings before a committee will be possible without approval of the President. The efforts of public representatives to secure adequate funds for eradication of Dutch elm disease, control of white pine blister rust, and control of other forest diseases and insects may be similarly hampered under this rule.

The Budget Bureau has recommended continuation of the present Dutch elm disease eradication appropriation of $261,156. This will be used to defray costs of supervision and overhead necessary to administer large sums which may be made available for carrying on the eradication campaign in cooperation with the states where infestations occur. Representatives of the National Committee on Dutch Elm Disease Eradication have appeared before the Bureau of the Budget and other executive branches of the government urging the necessity of $3,000,000 with which to carry on the campaign now under way. This is comparable with the emergency funds now available. More recently it has become apparent that part of this money must be made available by April 1 in order to avoid a disastrous break in the continuity of the work. The Subcommittee on Agricultural Appropriations will be urged to make adequate appropriations to conduct the present campaign when its hearings are opened to the public.

The recommended appropriation of $250,000 for white pine blister rust control is comparable to the current year's appropriation and faces a similar situation. About half of the $6,378,735 allotted from the Work Relief appropriation remains with which to carry on white pine blister rust control through the coming session. Because nearly $500,000 is necessary to carry on satisfactory administration of the large emergency allotments, special rules comparable to those now in effect will be required to release between $200,000 and $250,000 from the emergency allotment. The $400,000 for continuing the control of Gypsy moths and brown tail moths will probably be subject to similar use in connection with other emergency allotments.

The Soil Conservation Service which was placed in the Department of Agriculture during the past year is recommended to receive $27,500,000.

The Fletcher-Caldwell bill (S. 3417 and H. R. 9197) to extend credit to forest industries through a Forest Credit Bank in the Farm Credit Administration is apparently awaiting approval by the Budget Bureau before public hearings can be arranged with the Senate Committee on Banking and Finance.

The Biological Survey, for which appropriations were severely cut during the past year, stands to recover its lost prestige with recommended increases totaling over $1,200,000, so that the total appropriation may be $2,665,000. Among the items recommended to receive increases are those for the protection of migratory birds, the maintenance of mammal and bird reservations and biological investigations. Hearings on the Agricultural Appropriations started early in January and may continue well into February.

The National Park Service appears to have been cut from $15,871,390 to $9,528,080, but this is more than accounted for by the elimination of $7,500,000 for the building of roads and trails. All hearings on this and the other activities of the Department of the Interior have been completed, and the bill may be reported on the floor of the House before the first of February.

The Robinson Bill, H. R. 6594, proposing that the National Park Service make surveys of public lands for recreational purposes and to permit transfer of lands to the states, has been redrafted so as to eliminate all lands under the adiminstration of the Department of Agriculture, and a new bill, H. R. 10104, was favorably reported by the House Committee on Public Lands on January 10 and passed by the House on the following day.

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See D. B. Smith Ad Page 87

PHILIP W. AYRES, FORESTER

(*Continued from page* 72)

aid and cooperation, with the Federal Government acting as clearing house.

This constant thought about influencing the public to help itself has made Mr. Ayres an expert in propaganda — if that word can be used without sinister inferences. There is no one in the United States today whose judgment as to how a public movement should be organized and managed is more respected.

But perhaps his most enduring contribution is the demonstration that scenery and lumbering are not incompatible. In our National Parks we have an illustration of the other point of view, vast areas locked up from use in order to safeguard a few square miles of scenery. The White Mountain National Forest has scenery, too, and it is safeguarded, but lumbering goes on. Mr. Ayres has shown that each area should be devoted to its highest use, here an area of sawlogs, there no cutting allowed, just natural wild scenery, and in so doing has prevented New Hampshire from making the costly mistake of keeping her forests and parks separate.

All these achievements have made friends and some enemies. But Mr. Ayres has been very "careful in the choice of his enemies." This is one measure of his success. He can look back over his thirty-four years of service and know that those with whom he has worked would welcome him anywhere, at any time.

With this tribute does Philip Wheelock Ayres retire as forester for the Society for the Protection of New Hampshire Forests. It will go with him in his continuing service to the forest, as a director of The American Forestry Association, to which office he was recently elected.

THE CRYPTOMERIA OF NIKKO

(*Continued from page* 71)

are the tall and stately evergreen trees. Certainly the one who selected the cryptomeria as his tribute to the dead Shogun made a happy selection. The givers of the hundreds of stone and bronze lanterns that are scattered all over the temple grounds have long since been forgotten but the memory of the one who donated these lovely trees will live forever in the history of Nikko.

The average American, first seeing the cryptomeria, is sure he is facing his old friend from northern California, the giant redwood. For these Japanese trees are so similar to the redwoods that only an expert can properly locate them botanically. Like the reedwoods, they are evergreens, while in shape, growth, size, foliage, bark and texture of wood they are surely twin brothers. In fact, it is conceded that the cryptomeria, although native to Japan and some parts of China, is very closely related to the redwood.

Just how this came about in countries so far apart as Japan and America is something for the botanist and forester to say. But I did learn one thing which pleased me mightily. The word "cryptomeria" is Greek and means "with hidden parts," alluding to the manner in which the seeds are concealed in the brachts.

With their genius for experimentation, the Japanese gardeners have trained some of the grand old trees to grow into the dwarf type so popular in that country. Some of these are not over four feet high, yet are perfect imitations of their forbears.

MT. HOOD ON SKIS

(*Continued from page* 64)

weekends to keep from being run down by scooting figures who have lost control. They will tell you that E. J. Sickler played a definite part in introducing skis to Oregon. He talked skis and skiing on no provocation; he skiied himself; he bought skis and rented them; and always he kept up a continuous pounding at the State Highway Department to get them to keep the highway to Mount Hood cleared of snow. He got results.

Then, there is Berger Underdahl, a Portland Viking who, as his name might indicate, knows his snow and his skis. Mr. Underdahl is known as the father of the Portland Winter Sports Association.

Up to the time the association was formed five years ago, there had been no large organized effort to introduce the lethargic public to the sports and the beauties of the timbered snow field that rose 11,000 feet within sight of Portland. The several small groups were enthusiastic enough, but some co-ordination of effort was necessary.

So the Winter Sports Association was formed. In it are more than a score of smaller groups, all banded together to tell the world about Mount Hood and its forest playground. Among these groups are the various business and luncheon clubs, and such outdoor enthusiasts as the Mazamas, the Cascade and Silver Lake Ski Clubs, the Wy-East Climbers, the Trails Club, and the Multnomah Amateur Athletic Club, not forgetting the United States Forest Service which aids and abets in every way it can.

But the Forest Service does not encourage mountain climbing in the winter; rather does it do all it can to discourage such effort, unless the explorers are hardy and accomplished at the business. During the past eight years there have been a few tragedies on the mountain, mostly due to inexperienced mountain climbers, and there have been some thrilling hunts and rescues.

But if Portland and Oregon were slow to take advantage of the free and wide playground at their doorstep, they went at it with a will when they moved in. Every weekend from the first snowfall until spring, the highway is alive with cars headed for the mountain. Every Sunday from 2,000 to 5,000 brightly-clad figures make a vivid contrast against the white background of the forest. There is no place for skating as yet, but that will no doubt come in time. There are two toboggan slides, but no bob-sled course. Lack of these things, however, does not seem to bother a public gone mad about skiing.

And that, in brief, is about how the Oregon public moved in on the Mount Hood Forest.

But first of all, and before anything else, you've got to have the heritage of those old "crank conservationists" who became vastly unpopular with various and prehensile business interests, but who were primarily responsible for the Forest Service itself, and then for the National Forests and recreational areas. Were it not for them, Mount Hood and all other such spots would be a region of stumps and fire-killed snags, populated, if at all, by service stations and by horrible huts where hot-dogs in cellophane were sold to a public which firmly believed all conservationists were visionary.

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THE BANNER-TAIL

(*Continued from page* 70)

otherwise cultivated at and in each den. This means, on the Santa Rita, 200,000 cubic yards of earth under the direct influence of this one species of rodent. Once I asked the eminent botanist and soil scientist, President H. L. Shantz, of the University of Arizona, his opinion of the probable effect on the soil of all this rodent burrowing. His reply, prompt and unhesitating, indicated that in his view the work of rodents assists air and water to penetrate the otherwise hard soil of portions of the arid lands. That the work of burrowing rodents tends toward soil improvement has been clearly shown by the work of Professor Robert A. Greene and his associates at the University of Arizona.

The careful and convincing studies of Charles Darwin, who showed the importance in soil formation of the activities of earthworms, are well known to all. On the vast areas of the semi-arid and desert lands there are few earthworms to work the soil. Perhaps their place in soil formation is assumed, in part, by burrowing rodents. I have cited the case of a single burrower. It should be remembered that nearly all of the 1,000,000,000 rodents, more or less, in the State, are to be numbered among the soils cultivators.

A German forester once emphasized the fact that in nature the smallest things are often of the greatest importance. This assertion seems to be true of the animal kingdom. On the side of damage done, for example, the detrimental activities of certain rodents, according to government estimates, are from fifteen to twenty-five times as serious a problem as those of the larger predatory animals. Beneficial activities of rodents, as in soil making and insect consumption, may be correspondingly marked. It is always relatively easy to see the damage done by such secretive animals as burrowing rodents; the good usually becomes apparent only after painstaking study. To know just what should be done with the rodents, investigators must have facts and still more facts. It is clear that for rabbits in an orchard, or pocket gophers in an alfalfa field, or ground squirrels in a land dependent on irrigation ditches, the only recourse is to get rid of the rodents in as effective a manner as possible. It seems equally obvious that the largely insectivorous species, such as the grasshopper or scorpion mouse, ought to be carefully protected. The more that is seen of the situation the clearer it becomes that the rodents are of enormous significance, for better or for worse, not only to the vast areas of grazing range, but to the intensively farmed areas, watersheds, and forests.

MANGROVES AND MYSTERY

(*Continued from page* 56)

unconquered race. Selling furs, alligator hides, and charging admission to their villages brings them in their closest contact with civilization. And no wonder they stand aloof. They have been bullied and driven about; their lands and rights have been taken. But when the park becomes a reality the positions offered the Seminoles as guides in their own lands will be the first substantial compensation from the government that they have received.

Little archaeological work has been done in the park area, but five distinct races of aborigines have been so far traced through external study of various mounds and village sites. On Key Largo a large stone structure, attributed to the Mayan civilization, was partially excavated by a party from the University of Miami. The stones were placed together without mortar; fragments of obsidian (the closest occurs on the Yucatan Peninsula) came to light. Plants that played a part in the diet and industries of the Mayans were found growing about the ruin, showing that the inhabitants were agriculturists. Across the shallow Florida Bay are remains of a civilization that may be analogous to the one on Largo. Several ancient canals lead inland four miles to a group of mounds, one crescent shaped and covered with royal palms.

Legend has it that a colony of Arawak Indians, from Cuba, lived on the west coast at Turner River; Spanish explorers reported bands of Caribs on Florida shores. In fact, every strategic point in South Florida is a thesaurus of aboriginal remains. Complex civilizations flourished on these spots, and but await the spade of the archaeologist before they tell their story of Florida's past. It was a thriving country before the Seminoles arrived. Civilizations appeared and vanished; other peoples came and took their places and left a vestige of their art and industry.

The surface of South Florida, geologically speaking, is of comparatively recent origin as compared with the United States in general. Limestone, marl and muck are the only exposed formations. But despite the comparative newness the State has its share of prehistoric remains—fossil remains of beasts so totally alien from the present fauna that even the scientist is amazed at the animals which once roamed the prairies. In digging canals, workmen have come upon curious skulls and large bones which reveal a vast story to the paleontologist, and add another chapter to the history before the days of the Conquistadors and Indians.

South Florida is a wilderness, and in that condition, through the creation of the Everglades National Park, it will remain. The principal purpose of the Act providing for the establishment of the park, aside from the actual establishment, is that "No development of the project or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna and the essential primitive conditions now prevailing in this area." It is a land distinct from the other National Parks of the United States; there are no mountains nor valleys, no upheavals of rock and dirt; instead, there is living phenomena of a new sort.

All facilities for transportation, entertainment, and the housing of tourists will be developed by the National Park Service. Most of the sightseeing trips will be conducted from the water, as the numerous waterways afford economical thoroughfares and eliminate destructive highways. Sloughs that can be opened up with very little expense for canoe passage occur throughout the territory. Glass bottom boats can be used for viewing the colorful coral reefs that skirt Key Largo. Roads will necessarily be limited.

Under the care and protection of the government the wild animal life will increase. Such birds as the flamingo, which once frequented the Sable region, may be expected to return with the abolishment of vandalism. The forests will be given a better chance to flourish when protected from fires and other enemies. The area will be a sanctuary where primeval nature with its wealth of tropical plant and animal life may remain practically undisturbed through the years to come.

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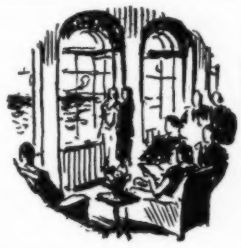

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(See Pages 88 and 89)

THE WOODED EARTH

(*Continued from page* 53)

horizon, "B" horizon exposed at the surface in patches or on large areas, bed rock exposed or covered with only a thin covering of "B." Hold up now before the mind's eye two pictures: one, the forest covered hills whose soil is deep, loose, litter-protected and fertile, variable, of course, as to depth and covered with a wide variety of species, each one of which has literally fought for its right to occupy the niche it holds. Each little clump of species is where it is because it proved better fitted through the struggle of the centuries than any other competing species. And each species is fitted into the myriad variations of soil depth, horizonal arrangement, topographic position, and bed rock characteristics. The picture is like a jig-saw puzzle—no, it is like a three-dimension jig-saw puzzle, if such a thing were possible. The other picture is one which does not call for imaginative effort. Jump into your car some bright day and meander through the hills almost anywhere. I do not need to tell you what you will see—it is despoilation and abandonment. Faulty methods of cultivation have undone that for which the forces of nature worked ten thousand years.

There are millions of acres of just such depleted and abandoned land in the Central States alone. The question is, what shall be done about it, and here lies the difficulty. Even if the soil existed in its virgin condition and so completely denuded of trees that no evidence remained of the original stand, in replanting the area it would be practically impossible always to place the right tree on the most suitable soil. In other words, a "hit and miss" method of planting can never be as good as the equilibrium selection by nature in the virgin woods.

Without a knowledge of specific site conditions and tree requirements, who can say plant yellow poplar here or white oak there or shortleaf pine on another site? Soil is so variable that only a detailed soil survey would give the needed information, and even then many mistakes would be made.

If it is difficult to reforest undepleted lands, how much more difficult is it to replace trees on land which has been so profoundly altered—land which has had its store of surface fertility exhausted, its porous upper "A" horizon eroded away—soil whose surface is so dense and impervious that it sheds from fifty to seventy-five per cent of the annual rainfall into the already overburdened streams? How can one expect moisture-requiring trees to thrive on the small fraction of the rainfall left after the largest portion of it has run off the compact surface. Some of the soils of the Central States have been altered as profoundly, as far as available moisture is concerned, as though the land itself had been moved from the central hardwood belt with its forty inches of rainfall to central or western Nebraska with less than half of that amount. Only those tree species which are able to endure drouth conditions can survive. There are certain species which can be used under dry conditions, but that is a matter of research and they must be fitted to the specific conditions of the site.

What farmer has not heard authentic stories of the man who supposedly bought Wine Sap or Delicious nursery stock and after ten or fifteen years discovered he had Ben Davis? How many, many orchards have been set out with high hopes and brought disappointment and despair because the soil proved unsuitable for fruit! The forester cannot afford to make mistakes that will take him decades to discover. He will make mistakes—plenty of them, and let no one forget it. He is confronted with a tremendously difficult problem. The only answer to his difficulty is research. A careful examination of soils where trees are growing successfully, made by men with a background of scientific and practical training in soil science and silviculture, would go far in preventing a boomerang of forest failure a generation hence.

What are the specific properties of A, B, and C soil horizons that make each so important in connection with forest growth? The "A" horizon of a forest soil is porous; the forest makes it so. The forest cultivates its own soil. Leaves form a roof over the bare soil and prevent rainfall from compacting it. The leaves serve as a filter to remove any muddy soil water which might clog cavities and drainage channels of the surface soil. The possibilities of growth in a forest depend to an overwhelming degree on the amount of available soil water.

There was no water shortage in the original forest. Beneath the trees was a porous receptacle to receive the rain. The soil became saturated and the water, cooled and filtered, bubbled out from fern-fringed springs. There was no erosion problem in the original forest. The soil was held by the tree roots, protected by litter. Rainfall could not run off fast enough to start erosion. Recent, well substantiated figures on rates of water absorption show that the "A" horizon of forest soil absorbs rainfall as much as fifty times as fast as does that of adjacent cultivated fields. There is no cover equal to forest cover for catching and holding rainfall. The porous "A" horizon absorbs water rapidly, retards, its rate of surface movement, and permits its slow absorption into the lower soil horizons.

The forest is like a billion little dams built to hold back the floods of rapid runoff. Remove the porous "A" horizon and the rate of run-off increases tremendously, because the "B" horizon cannot absorb rainfall rapidly enough to prevent its escaping as surface water. This is especially true when vegetative cover has been removed and the surface water becomes burdened with a load of soil particles. The soil in suspension simply clogs up the pores in the soil through which the water might be absorbed. Without an "A" horizon, the chance of absorption of rainfall is much like trying to pour a large stream of water through the little end of a funnel—most of it is spilled. Soil expands when heated and the forest cover protects the consequent porosity. Roots penetrate the surface soil; insects, worms, and rodents dig channels. Freezing and thawing heave the soil. Roots twine themselves around the particles and hold the loosened mass together. The dead leaves and twigs fall and decay to add to a continuously growing supply of readily available plant food. The forest builds all this and preserves it. Cultivation destroys the structure, allows the rainfall to remove the fertile upper horizon.

The "B" horizon, although more dense, enables capillary water to rise from greater

depths, slows the drainage of ground water, and up to a certain density, is helpful. Beyond that point, an increase in tightness is very detrimental to tree growth because it does not allow rainfall to penetrate fast enough; consequently, a larger percentage of water runs off. When this subsoil is exposed at the surface by erosion of the surface soil, it bakes and cracks and grows very hard and dense during hot, dry weather. Soil is not a dead thing—it lives and breathes. If water can percolate downward through it, air can follow, and soil must have air or it dies and every living plant and creature in it dies. Remove the "A" horizon and expose the tight "B" horizon, and tree roots have no chance of thriving. Seedling trees cannot get a foothold because they cannot endure the high temperature and lack of water.

The "C" horizon usually has little effect on tree growth unless it is dense and too near the surface, in which case there is not enough of a reservoir to hold sufficient rainfall. Or, if the "C" horizon is very coarse sand or gravel, the rainfall drains away too fast and the soil becomes dry. The proper combination of A, B, and C horizons decides in any given site what trees will thrive there. In the case of an eroded field, it is often impossible to grow certain tree species even though they occupied the land before it was cultivated. Take a jig-saw puzzle nicely pieced together, shake it up, throw it out the window, then attempt to collect and assemble it and you have some idea of the difficulties confronting the reforestation of depleted and abandoned land. Such land can usually be covered with some kind of vegetation—it can be covered with certain kinds of trees; but attempt to cover it with a productive forest and you have a problem that can only be solved by experimentation and research.

It is not often possible to tell what to plant on a bare area by casual observation. The odds of soil variation are too great. A difference in soil structure often means the difference between success and failure. On one southern Indiana farm, the owner planted black walnut with complete failure; he next tried red pine and it failed. Finally, he set out Virginia pine and is getting good growth. One southern Ohio plantation of yellow poplar illustrates in a one-acre planting the difficulty of foretelling success without soil examination. On one part of the seventeen-year-old planting are trees eight inches in diameter and forty-five feet high; in another part a hundred feet away, no tree is over two inches in diameter or over eight feet high. The soils look alike, yet beneath the good growth is a porous soil downward to the shale "C" horizon, and beneath the poor growth is a "B" horizon of tight plastic clay. In a distance of one hundred feet, there is one soil which absorbs a large portion of the rainfall and another which absorbs only a small portion. One is a moist site, the other a dry site. One remains loose in dry weather, the other grows hard and refractory. Yellow poplar cannot thrive in a hard, dry soil; hence it fails on most of this plantation.

Numerous examples could be cited from the observations of hundreds of black walnut and black locust plantations scattered from the Missouri River to New York and from Michigan to Tennessee where inferior growth has occurred on rich farm land, and where excellent growth has ensued on land of much poorer fertility but with better structure with adequate soil water.

With the emphasis on reforestation, foresters are confronted with many unanswerable questions. They are constantly asked —"What should I plant here?" or "What would you do with this or that area?" These questions about suitability of trees to soil can be answered in most cases only in a general way. A vast amount of research is critically needed if costly mistakes in time and money are to be avoided. It is regrettable that forest soil research could not have preceded the present program by twenty-five to forty years. Little is known concerning the conditions of soil optimum for growth of various tree species. Who is there that can say just where in the hardwood region one should plant hardwood species and where pine? A hundred years of trial and error may teach us, but properly directed research on the relations of tree species to soil conditions would save much time and many mistakes and make the "batting average" higher. Forestry needs plenty of hits and some home runs if land-use problems are to be solved before it is too late.

The whole problem of management of established forests for maximum permanent production is inseparably connected with a thorough knowledge of the relation of tree species to soil development. It has been said that forests are cultivated with the ax. It is largely through the litter dropped from trees that forest soil porosity and forest soil fertility are built up and retained; and it is only by proper soil porosity that an adequate amount of rainfall may be absorbed. By the proper selection and mixture of species whose litter will give the best soil cover and carry the proper manurial value, can soil tilth and productivity be perpetuated. The "A" horizon must be protected from compaction by rain—it must be supplied with the proper mineral elements through the litter-fall.

It is unnecessary to tell the story of farm land erosion. This has been done admirably by the soil conservationist. Faulty agriculture has lost the American people an empire. But there is one story that should be shouted from every housetop, from every soap box, talked around the cannon stove in every grocery store, gossiped across the line fences of a hundred thousand hill farms while Jim and Bill allow the "nags" to switch flies and cool off, and that is:—reforestation will solve the erosion and water conservation problems on hill land, but that reforestation cannot be done "hit or miss."

There must be a sincere and determined effort in the way of careful examination of soil—research if you will—before extensive reforestation operations are undertaken. The American people appreciate the value of research in industry, but do they recognize the similar necessity of forest research upon which depends the future of the forest lands—equal to one third of the total area of this country?

During early days at the University of Illinois, a crew of soil surveyors working near the insane asylum at Kankakee narrowly escaped arrest and detention for boring holes in the ground. The guards thought they had lost some of their inmates. Today conditions are different. The warnings of the early soil investigators are being heeded, and these pioneers, with their associates of later years, are organized to stem the advance of the forces of erosion. Along with this soil saving must go research in forest soil and a delving into the simple A-B-C soil alphabet which will lay the groundwork for replacement of the forests, not only to provide needed lumber but to make our hill soil safe for all time.

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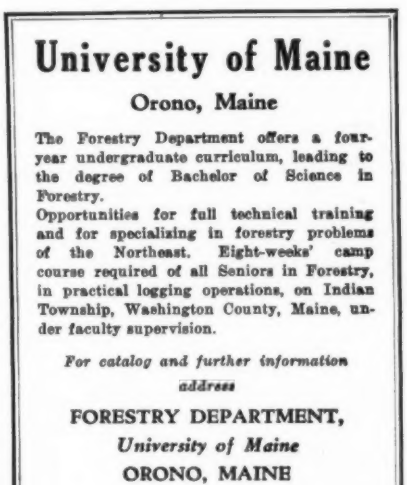
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Dean Massachusetts Conservation Commissioner; Shantz to Direct Wildlife for Forest Service

Ernest J. Dean, of Martha's Vineyard, Massachusetts, has been appointed Commissioner of Conservation in Massachusetts, succeeding Samuel A. York.

A member of the State Legislature since 1923, Mr. Dean has served for nine years on the Committee on Conservation, five years as its chairman. He also has been a member of the Committee on Harbors and Public Lands, and served as vice-chairman of the Commission to revise and codify the Marine Fishery Laws of 1930 and 1931. For three years he was a member of the advisory board of the Director of the Division of Fisheries and Game.

The appointment of Dr. Homer L. Shantz, president of the University of Arizona, to be chief of the Division of Wildlife Management

ERNEST J. DEAN

of the United States Forest Service was announced January 3. The appointment will become effective June 1. Dr. Shantz has since boyhood been intensely interested in the conservation of American wildlife, and has followed biological, botanical and zoological lines of work throughout his career as a scientist and educator. He was formerly associated with the Department of Agriculture.

Resignation of Seth Gordon as secretary of the American Wildlife Institute was announced late in December. Mr. Gordon, nationally known as a wildlife authority, will return to the post of executive officer of the Pennsylvania Game Commission, which he held for a number of years before entering the national conservation field.

In Oregon, J. W. Ferguson, of Portland, has been appointed state forester to succeed Lynn F. Cronemiller. He has been associated with the Oregon State Board of Forestry for twenty-five years.

David T. Mason, manager of the Western Pine Association, and well known consulting forest engineer, announced his resignation on December 31 to resume private practice. No successor had been appointed at the time of going to press.

WHO'S WHO

Among the Authors in This Issue

John T. Auten

JOHN T. AUTEN (*The Wooded Earth*), associated with the Branch of Research, United States Forest Service, Columbus, Ohio, is engaged in forest soil studies of the Central States. A descendant of one of the early pioneer families of Illinois, Mr. Auten was graduated from the university of that state and later received his doctor's degree from the Iowa State College.

W. ADRIAN WILLIAMSON (*Mangroves and Mystery*), although born in New Jersey, moved to Florida at the age of five and spent his boyhood days cruising among the Florida Keys and Everglades. Becoming interested in zoology, he studied at Duke University and spent his summers collecting specimens from Quebec to Cuba.

WALTER P. TAYLOR (*The Banner-Tail and Other Burrowers*), connected with the Biological Survey of the Department of Agriculture, is in charge of the research unit of Texas A & M College.

PRESTON KING SHELDON (*A Monarch Dies*) is a journalist who lives at Flushing, New York, where he spends a good deal of time studying and photographing trees.

STEWART HOLBROOK (*Mount Hood on Skis*) lives in Portland, Oregon. He is well-known as a free-lance writer. Born in Vermont, in his early days he worked in logging camps and took part in great river drives. After serving on the Meuse-Argonne front with the 303rd Field Artillery, he returned to do more logging in British Columbia, taking up editorial work and writing in 1927.

CALVIN RUTSTRUM (*Has Man A Sense of Direction*) is well known to readers of AMERICAN FORESTS. He lives in Minneapolis where he specializes in criminal investigative work.

E. L. TURNER (*Characters in Wood Bring the Old West to Life*) is a food chemist on the Pacific Coast who became interested in the lumber industry by way of cooperage, which plays such an important part in food products packing. He lives in Eugene, Oregon.

WILL C. BARNES (*Cryptomeria of Nikko*), author, rancher, and grazing expert, was for fourteen years assistant forester in charge of the Branch of Grazing of the Forest Service. Resigning in 1929 "because the pioneering work in range management had been done," he became secretary of the United States Geographic Board, and later, after a world tour, returned to Arizona to complete a series of books. Among his best-known works are *Western Grazing Grounds and Forest Ranges, Tales from the X-Bar Horse Camp, Arizona Place Names*, and numerous short stories.

K. W. WOODWARD (*Philip W. Ayres, Forester*) is head of the Department of Forestry of the University of New Hampshire. He was formerly connected with the Forest Service and is the author of *Valuation of American Timberland*.

JOHN H. FURBAY (*Field and Forest for Boys and Girls—Animal Professions*), formerly connected with the College of Emporia, Kansas, is at present on an extended tour which will take him into Africa for several months and then around the world.

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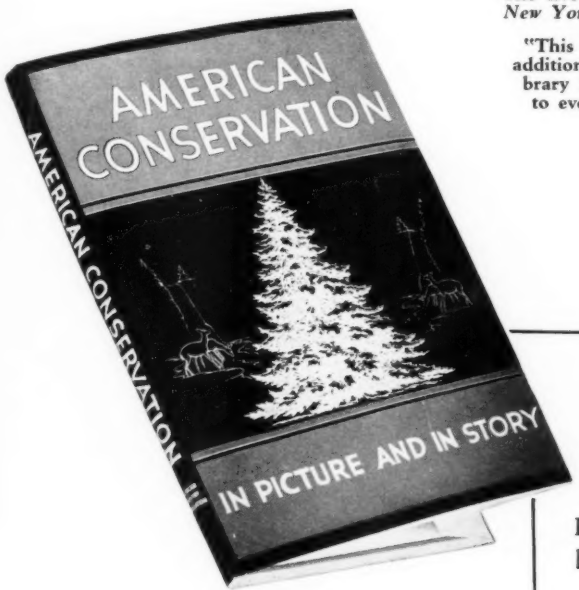

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